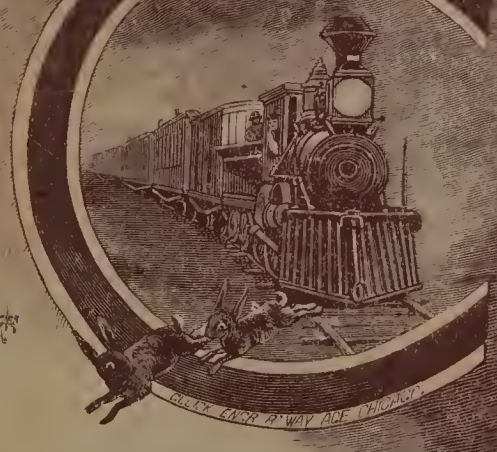
THE RAILWAY AGE CAR



THE RAILWAY AGE CAR.

THE

MODERN RAILWAY CAR

AS ILLUSTRATED BY THE

EXHIBITION CAR

BUILT FOR

THE RAILWAY AGE,

BY

PULLMAN'S PALACE CAR COMPANY,

FROM

SPECIMENS OF THE BEST MATERIALS AND APPLIANCES,

FURNISHED BY

LEADING MANUFACTURERS AND DEALERS.

CHICAGO, U. S. A.
THE RAILWAY AGE COMPANY, PUBLISHERS.
1883.

PRESS OF
KNIGHT & LEONARD.
CHICAGO.

The Railway Age.

RETROSPECTIVE AND PROSPECTIVE.

EIGHT years ago the railway interest of the United States was at a comparatively low ebb. The annual record of construction showed a smaller mileage than for ten years previous, notwithstanding the growth of the country, and an almost incredible proportion of our railways were passing through the stages of bankruptcy. But there were signs of a revival of this great interest, and it was felt that the time had come for the publication of a journal of broad scope and progressive tendencies, which should aim to fitly represent the railway interest, to gather and disseminate information pertaining to it, and to encourage the growth and development of our railways and of the diversified industries intimately connected with them. Accordingly in June, 1876, The Railway Age was established. In the first number these words were used:

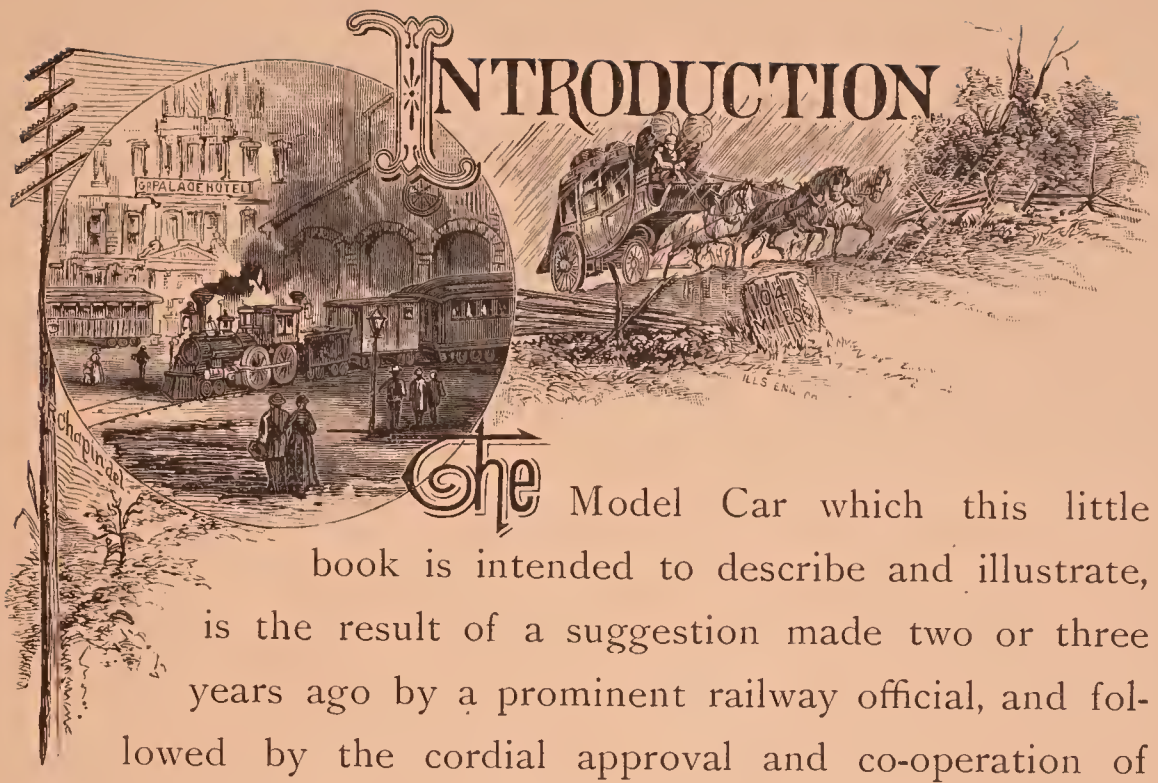
"Its purpose is to fully and independently discuss, not only the purely technical and mechanical features of railroading, but to devote still larger attention to facts and ideas of interest, not only to those departments, but more especially to many thousands of non-scientific officers and employes, who seek a wider and less abstruse range of information, and whose best energies are devoted to the service of the railway companies of this country,—to combine the popular with the technical, entertainment with instruction, so that every railway man may find in its pages something of interest and value. The intention also is to make The Railway Age a paper which will be read with interest and profit by other than railway men — to make it comprehensive without diffusiveness, practical without dryness, and solid without heaviness,— of positive value to those who build and operate, and to those whose money is invested in railways."

The Railway Age of to-day is a satisfactory proof of the correctness of the principles upon which it was founded. Its success has been

far greater than its originators ever dared to hope for. It has received the cordial and generous encouragement of railway men of all classes, and of manufacturers, dealers in railway belongings, inventors, investors and the public press, to all of whom it has aimed and will ever aim to give a full return. Its name and its circulation have become not only national but cosmopolitan, and its weekly issues visit many lands.

The railway interest is growing rapidly, and THE RAILWAY AGE will endeavor to keep abreast of its progress. Grateful for the past and ambitious for the future, being absolutely free from connection with or bias for any particular company or interest, and determined to serve not only the railways, but also those with whom the railways do business, justly and impartially, THE RAILWAY AGE hopes for a continuance of the favor and esteem of both.

INTRODUCTION



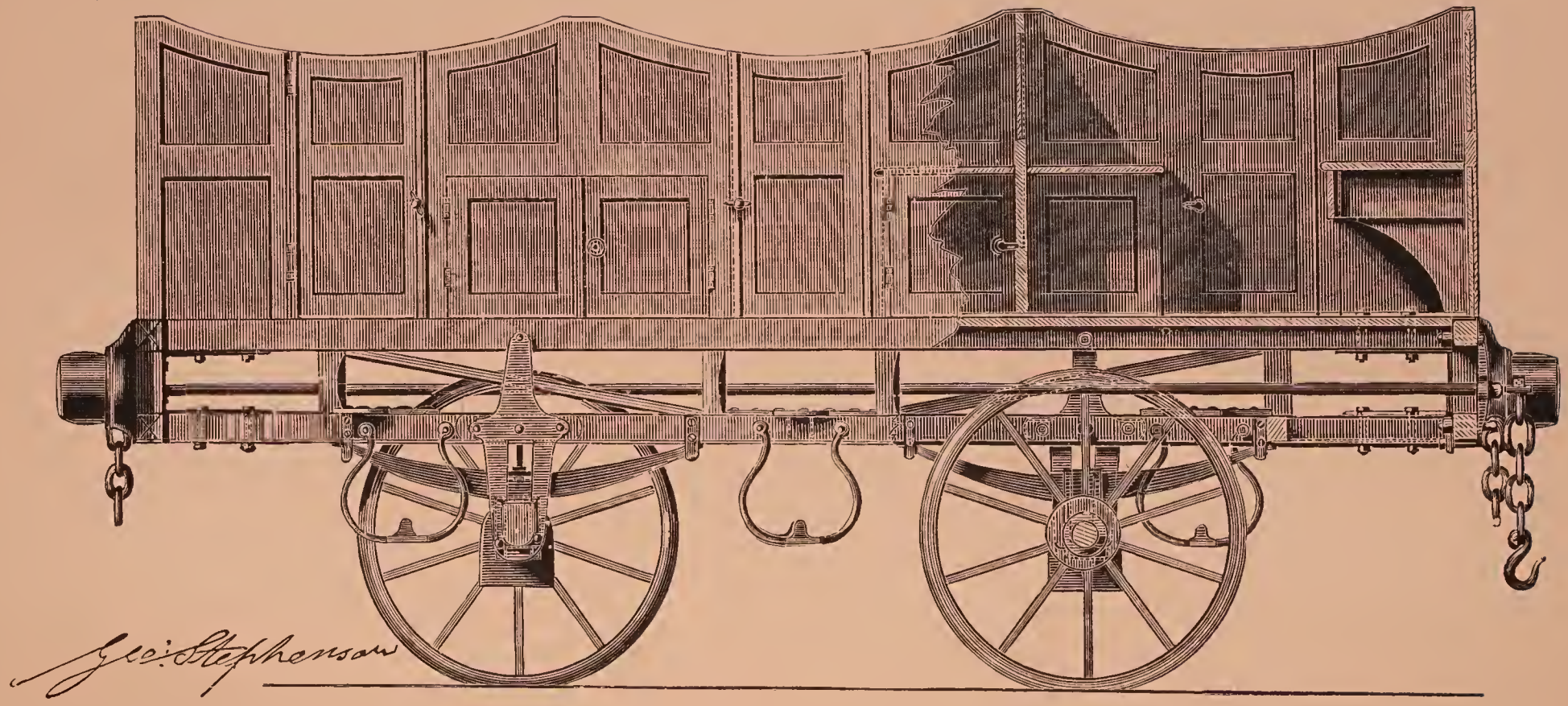
The Model Car which this little book is intended to describe and illustrate, is the result of a suggestion made two or three years ago by a prominent railway official, and followed by the cordial approval and co-operation of many of the leading manufacturers of and dealers in railway appliances and supplies throughout the country. The idea was to produce a car which should be a model of the most improved style of modern passenger car construction and furnishing, and it is believed that the result more than justifies the most sanguine expectations. Strength in the framework; safety and ease of operation in the running parts; comfort and luxury in the internal arrangements; beauty and good taste in the adornments; the best results of inventive genius, proved by practical use, in the various appliances which the growth of the science of railway operation has developed—these are here exhibited more perfectly, it is thought, than in any railway car ever before constructed.

HISTORICAL.

THE railway car is decidedly a modern invention. The world had carried on its locomotion by various primitive means—on foot, on horseback, by boats, by dog sledges, by ox carts made of pieces of wood fastened together by thongs, by clumsy wagons and clumsier coaches; and at the end of several thousand years, the stage-coach, drawn by four horses, was believed to furnish the acme of luxury and pleasure for the traveler.

The railway car dates back scarcely more than fifty years. It is an infant in age compared with previous kinds of conveyances, and yet the railway car of to-day is as different from and as much superior to that of 1830, as the gorgeous four-horse mail coach was superior to the Pembina ox cart, which only a very few years ago, before the railway had reached the Red River region, occasionally came creaking down to St. Paul.

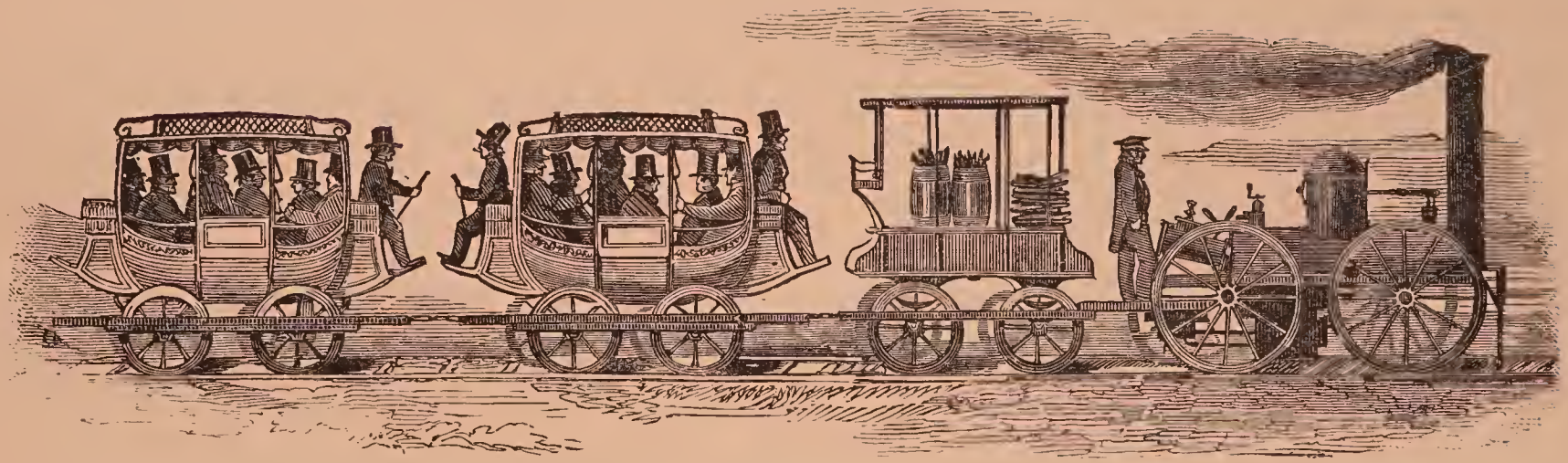
The first railway carriage was really nothing more than a stage-coach body placed on small wheels running upon a track. We have all seen illustrations of the first train run in the United States, consisting of several coach bodies fastened together, with six or eight people crowded on the inside, and others on the top and on the front and rear seats. This was considered luxurious traveling in those days. To merely have their stage-coach run upon a level road and drawn by steam instead of floundering through mud and climbing



First Passenger Car Drawn by Steam in the World. Engraved from an Original Drawing by George Stephenson.

mountains, drawn by jaded horses, was of itself a sufficient luxury; and our simple predecessors did not think of having their coaches heated, or lighted, or protected from the weather, much less of having room to walk around and even to lie down in; while the idea of sleeping and eating upon the cars, running, too, at the rate of forty or fifty miles an hour, did not even occur for many years to the pioneers of our railway system.

But the railway came to revolutionize existing ideas, and in no other way has the progress of thought and invention been more rapidly illustrated than in the improvements which have been developed in the past few years in connection with railway equipment. As we have said, the first railway carriages were little more than stage coach bodies on car wheels. This general form is still adhered to throughout the old world, the modern European railway car being simply three or four stage coaches joined together, each compartment representing almost precisely the stage coach method of seating passengers. Of course great improvement has been made in the furnishing of these carriages, and the modern luxuries of lighting, heating, and fast running have been added; but after all, the European railway carriage is an inferior piece of workmanship in respect to size, convenience and general impressiveness, compared with the latest productions of the American car builder's skill. The first railway cars in this country were built on the stage coach plan, but American inventors soon conceived the idea of more generous accommodations, and a car with a door at each end and seats on each side of the long aisle running down the center was introduced. It was a very primitive vehicle, however. As proof of this let the reader turn his critical attention to the illustration on page fourteen, showing a passenger coach on the Michigan Central Railroad less than forty years ago. We have copied the illustration from an original schedule of rates of

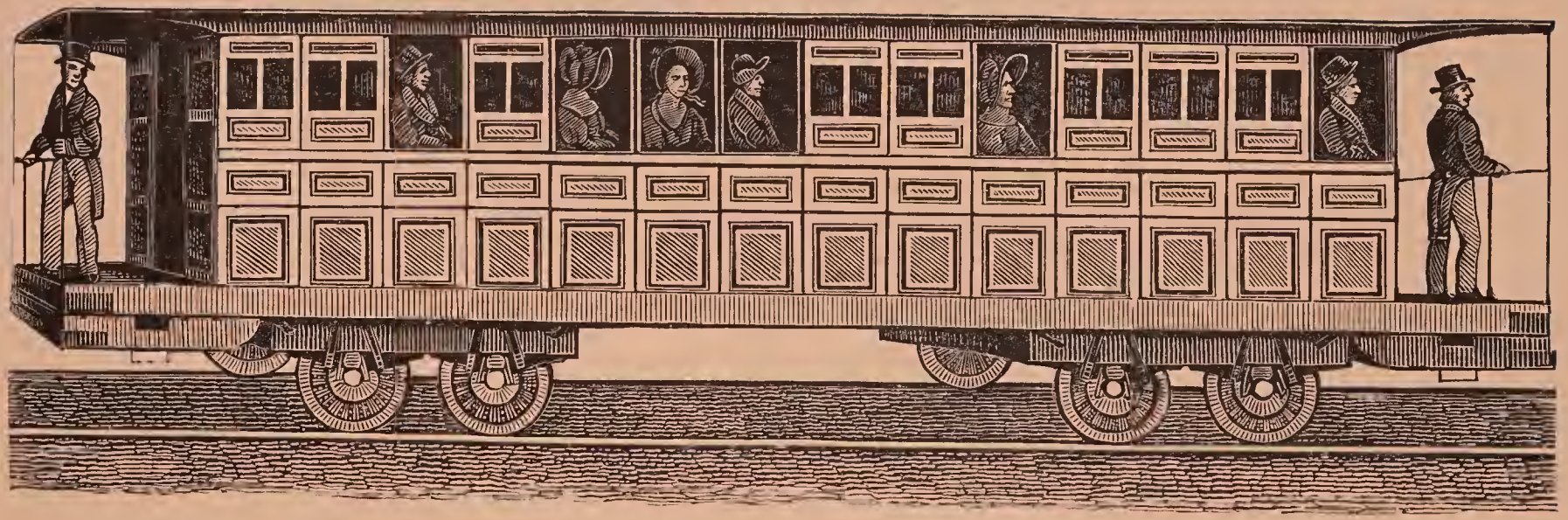


First Passenger Train Drawn by Steam in the United States.

freight and fare on the Michigan Central Railroad, issued by the Board of State Commissioners, who then ran the road, dated Detroit, September 2, 1844, and preserved by the late Col. Samuel Stone, who was an officer of the Board.

By comparing this curious vehicle with the modern day coach or sleeping car it will be seen that wonderful improvements have been developed in the last few years. Instead of four little wheels under each truck, we now have four, six or eight great forty-two inch steel-tired paper-cored wheels, upon which the traveler rides at the highest rate of speed without fear of accident. Instead of the low flat roof, on which the sun must have been wont to beat down with painful effect upon the plug hats and coal-scuttle bonnets of our respected ancestors, as they appear at the curious windows of the antique car in the cut, we have now the high deck, furnishing an abundance of light and ventilation. The early Michigan Central travelers apparently were not sensitive to cold, as there is no evidence of any heating apparatus in the car, and if we could enter this vehicle we should, no doubt, find that little attention was paid to upholstering, decoration or carpeting. This was the "palace car" of only a few years ago. The sleeping car, drawing-room car, dining car,—and above all, the private car combining all the attractive features of these vehicles—are the product of the genius and taste of a very recent period.

Looking upon this primitive car, and considering the awful discomforts which attended a journey by rail in such a vehicle, the thoughtful observer, as he reflects upon the millions of people who journey by rail every year now-a-days, will be impressed with the conviction that no class of men has contributed more to the comfort and enjoyment of the civilized world of the present day than the builders of the modern railway car, aided by the manufacturers of the various appliances and articles which belong thereto.



Car of 1848, on Michigan Central Railroad (Then Owned by the State of Michigan).

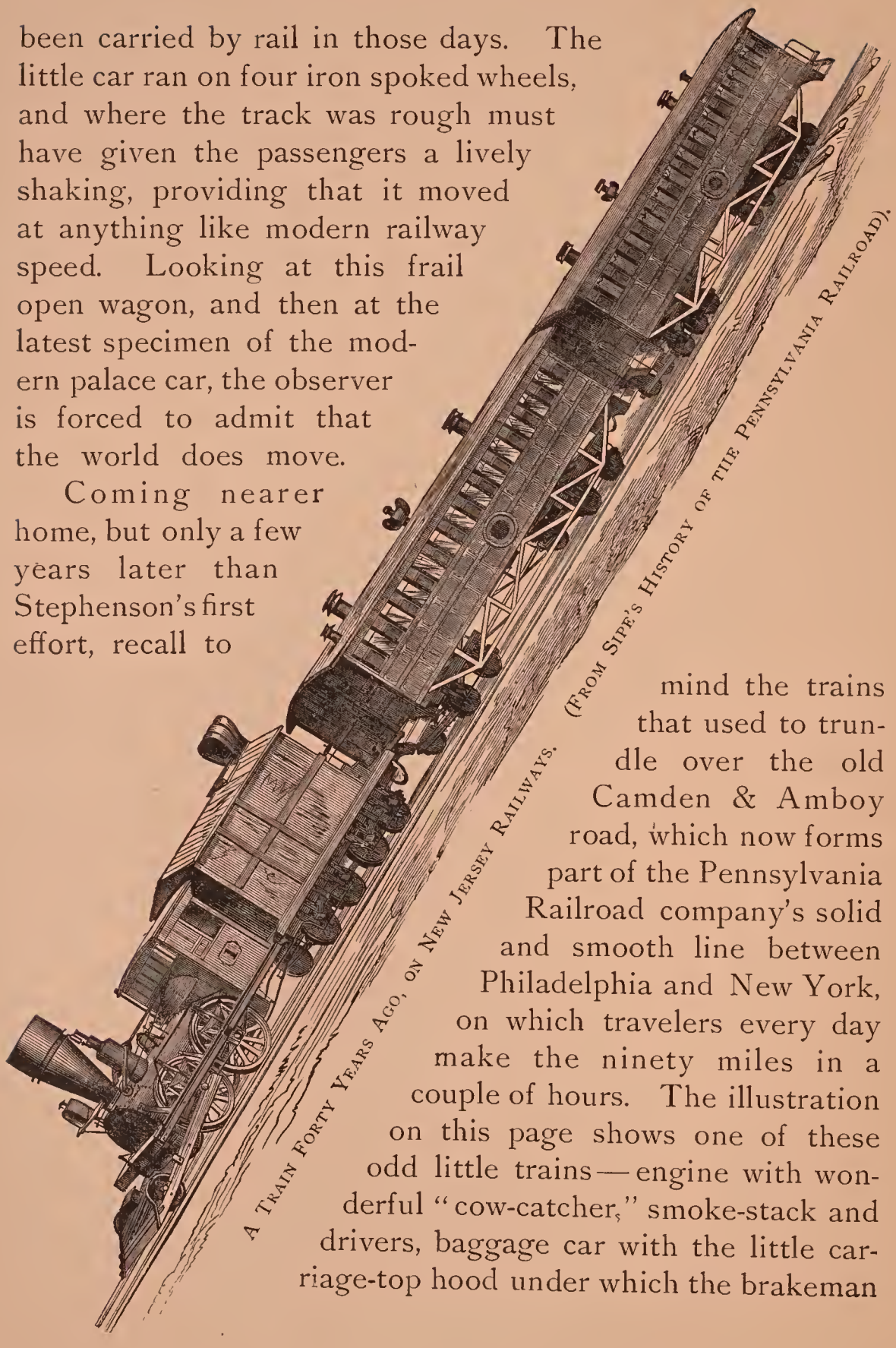
By way of contrasting still further the present with the early days of railway history — and they are within the recollection of many who read these pages — let us see what sort of vehicle the first passenger car was.

By rare good fortune we have been able to secure a copy of a drawing, by the great George Stephenson, of what was probably the first railway passenger car built; and from this we have had a reduced engraving made, which is presented on page ten. The difference between this primitive conveyance and the latest production of car building skill, as represented in *The Railway Age Car*, is certainly astonishing. For the use of the drawing from which this cut is copied, we are indebted to Mr. J. B. Winslow, of Boston, one of the earliest railway officers in the country, who, although now comfortably retired from the engrossing cares of railway management, still takes great pleasure in noting the progress of the interest which has grown to such vast proportions within his active lifetime. Mr. Winslow writes: "I have forwarded to you the drawing of a passenger car, with the autograph of George Stephenson upon it. He sent to the Lowell Railroad before it opened (which was in June, 1835) a number of drawings showing the various parts of a railway, including these among others. This drawing evidently was copied from one that was used to build the cars from some years before its date, 1832. I have no doubt the original was used for building the first passenger car ever constructed."

Imagine travel by rail now-a-days accomplished in a little open wagon like that shown in the illustration. The passengers sat face to face in three little boxes, reached by a single long step. Their knees must have nearly touched, and the backs of the seats were hardly higher than the ordinary chair back. There was no cover nor protection from the weather. The baggage was pushed in through the little doors under the seats, and it is evident that no Saratoga trunks could have

been carried by rail in those days. The little car ran on four iron spoked wheels, and where the track was rough must have given the passengers a lively shaking, providing that it moved at anything like modern railway speed. Looking at this frail open wagon, and then at the latest specimen of the modern palace car, the observer is forced to admit that the world does move.

Coming nearer home, but only a few years later than Stephenson's first effort, recall to mind the trains that used to trundle over the old Camden & Amboy road, which now forms part of the Pennsylvania Railroad company's solid and smooth line between Philadelphia and New York, on which travelers every day make the ninety miles in a couple of hours. The illustration on this page shows one of these odd little trains — engine with wonderful "cow-catcher," smoke-stack and drivers, baggage car with the little carriage-top hood under which the brakeman

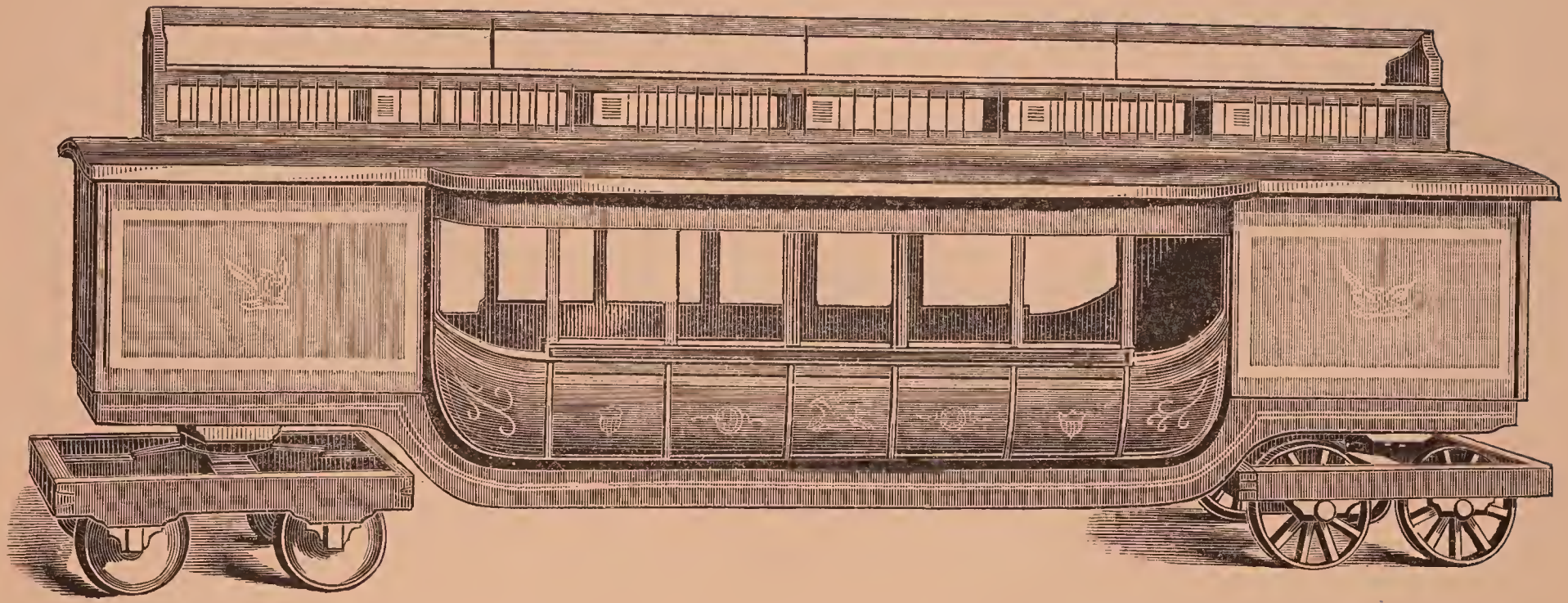


A Train Forty Years Ago, on New Jersey Railways. (From Sipe's History of the Pennsylvania Railroad).

sat perched to view the landscape o'er — no running of trains by telegraph in those times,— and modest little four-wheeled deckless cars, such as immigrants would scorn to ride in now-a-days. Imagine the great Pennsylvania company boasting of such vehicles to-day! Imagine a journey across the continent in such a "first-class coach," instead of the modern Pullman palace car!

Another interesting specimen of early railway car construction is illustrated by the accompanying cut of the first passenger car, having a Monitor or raised roof, built in this country. The illustration is engraved from a photograph of a model now in the office of the Eastern Railroad Association, at New York. For the use of this model for this purpose, and for the following interesting information with reference to the car referred to, we are indebted to Mr. Andrew McCallum, Secretary of the Association above named:

"This car, called the 'Victory,' was built for and run on the Philadelphia & Germantown Railroad in 1836. As I am informed, its first trip was made July 4, of that year. It was constructed on the principle then advocated by Mr. Richard Imlay for supporting the body of a car, and for which he obtained a patent the following year (1837). It was an eight-wheel car, and consisted of a coach body dropped between the trucks, with a compartment at each end over the trucks. One of these compartments represents a water-closet and toilet, while at the other end of the car we find what was evidently intended for a bar. The center of the roof is raised, and runs from end to end of the entire car. The raised part is divided down the center so as to provide a back-rest for two rows of passengers sitting back to back and facing outwardly. The seats in the main body of the car were placed around the sides (omnibus style), and the door was in the side.



First Monitor or Raised Roof.

"At the time the model was purchased from the administrator of Mr. Imlay's estate (1869) the following named persons were interviewed concerning its authenticity: Mr. Joseph F. Talson, of this city, who was present and saw the 'Victory's' trial trip around a curve (it being constructed without the usual king-bolt, there was some question as to how it would work), Mr. Laban B. Proctor, then (1869) working for C. Allison, car builder, Philadelphia, Pa. (Mr. Proctor assisted in building the 'Victory' in 1836, and Mr. Allison was also knowing to its existence at that time); Mr. George Campbell, of Philadelphia (better known to railroad men there as 'Old Whitey'), who was employed on the Germantown road July 4, 1836, and remembered its being put on at that time.

"The foregoing is all the information I possess regarding the old car 'Victory.' I never knew its dimensions."

For the purpose of showing to what a degree of perfection the art of car building has reached, a number of the manufacturers of and dealers in articles used in car construction have co-operated with *The Railway Age* in securing the construction of a private car which should be in every respect a model of its kind. That great institution, Pullman's Palace Car Company, which has now for many years held acknowledged eminence in the business, both of operating sleeping cars and of constructing cars of all kinds, and to the taste and liberality of whose head and assistants the whole traveling world is under vast obligation, readily co-operated in the enterprise of the model car and undertook its construction. How magnificently they have succeeded, *The Railway Age Car*, which this little volume is intended to describe, very satisfactorily tells.

DESCRIPTIVE.

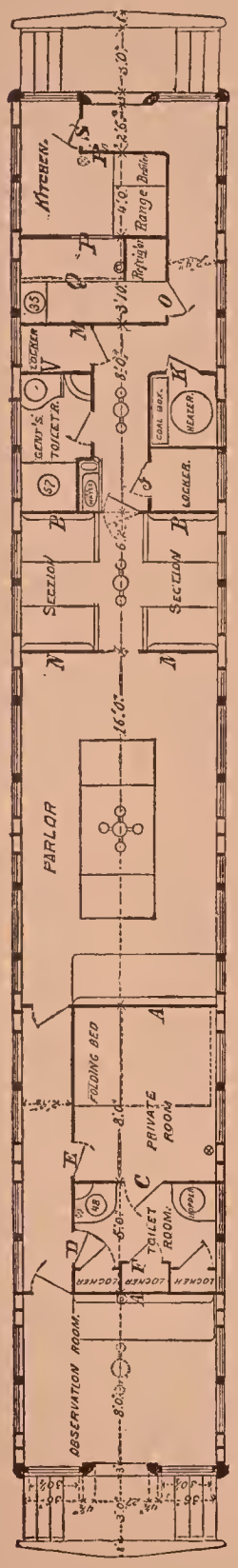
THE frontispiece, showing an exterior view of this car, with which this volume is introduced to the reader, is necessarily not as perfect as could have been desired, because of the impossibility of fitly showing so large a subject on so small a page. But it nevertheless conveys some idea of the proportions, the finish, the decoration and the general effect of the whole, although but a part is here represented in detail. Could the color, the ornamentation, the more minute features of the entire treatment have been presented, the reader would doubtless be better pleased, and the work of the brain which conceived the design, and of the hands which wrought the result, in this magnificent vehicle,—*The Railway Age Car*,—would have been more creditably illustrated. However, it is sometimes possible to make amends for an insufficient reward of genius bestowed in one way, by doing it more ample justice in another,—and so we propose showing the reader leisurely through this car and briefly describing its several apartments and furnishings as we proceed.

Before entering, however, let us glance at the "running gear," which in a railway car is one of the most important elements to be considered,—one which has very much to do with the comfort and safety of those who travel. Twelve paper wheels, forty-two inches in circumference and supplied with the very best steel tires, support the car, the massive and yet symmetrical trucks under which they are placed being of the regular Pullman standard pattern for six wheels. The springs, too, are models of excellence, are made of finest steel and are highly polished. The air brake apparatus and the usual rods and bars of steel which give strength to the superstructure, complete this very important department of the car, the effect of the whole being comfortably assuring even to the most timid traveler contemplating a journey.

We step upon a roomy platform, through an ornamental gate made of wrought steel with brass ornamentation, the whole from original designs which at once attract admiration, and enter the observation room.

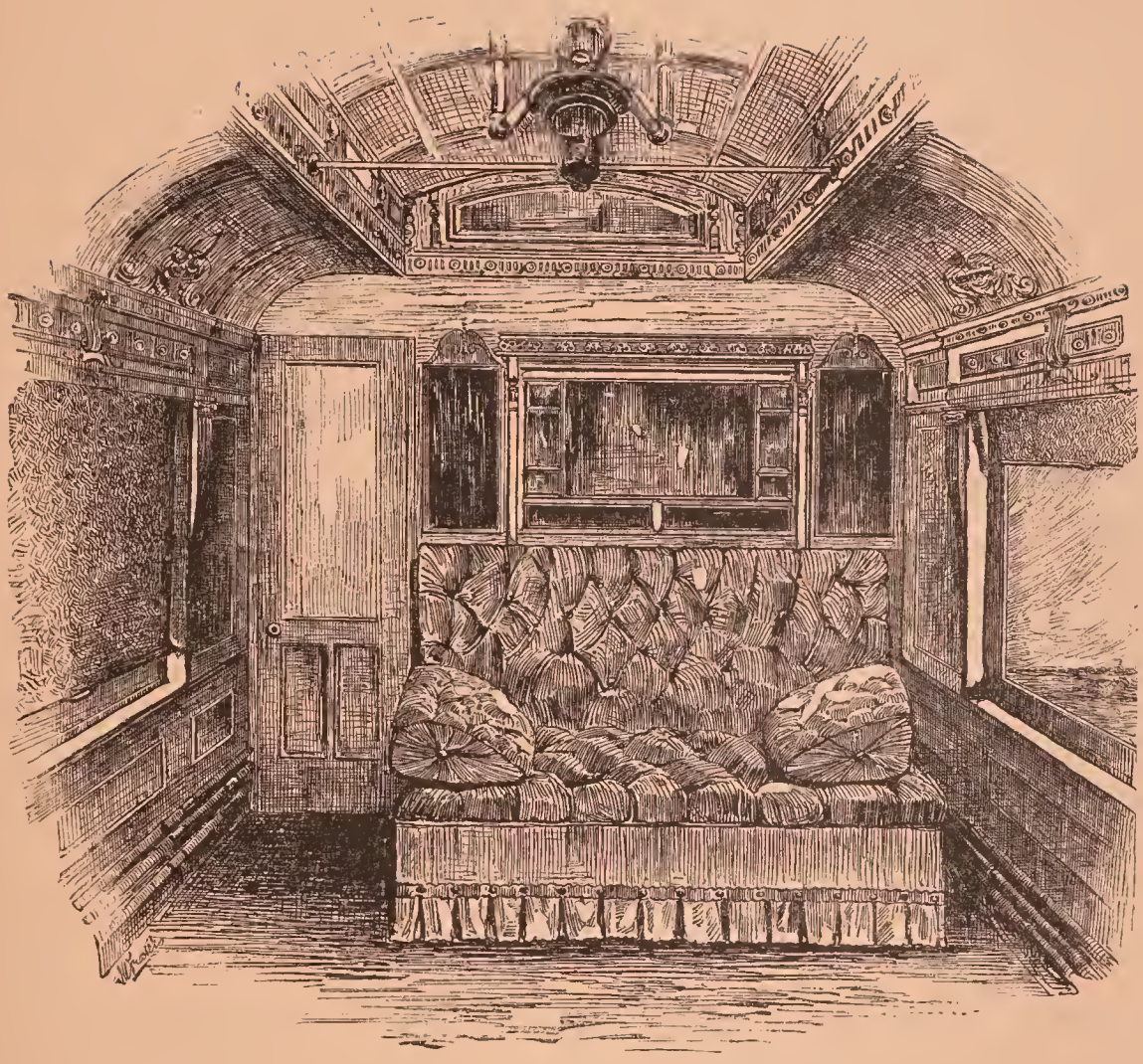
This room, which, as its name implies, is intended for occupancy when it is desired to view the road bed, track, bridges, etc., is 8×9 feet in size,

and is finished in oak, the style being an adaptation of the old English and Dutch combined, very similar to that employed a hundred years or more ago in the Colonial mansions of Virginia, New York and New England. The end windows are very large, being of French plate 27 inches wide and 49 inches long, reaching almost to the floor. The door has two large lights of glass, the upper of which is handsomely embossed with the name of "*The Railway Age.*" At the opposite end of the room is a beveled mirror, 22×32 inches, flanked on either side by three smaller ones, which in turn are flanked by bronze tablets, 11¼×28½ inches, containing the names of the various firms represented in the construction and furnishing of the car, beautifully engraved. Under this mirror are two other bronze panels or tablets, one having engraved on its surface "*The Railway Age Exhibition Car,*" and the other, "*Pullman's Palace Car Company, Builders.*" A sofa, upholstered in fine leather and so constructed as to form two sleeping berths at night, occupies a place under this mirror, and two patent reclining chairs, also upholstered in leather, are permanently attached to the floor immediately in front of the end windows, a number of small camp chairs being distributed about the room. A silver-plated two-burner lamp is suspended from the ceiling, and a richly mounted instrument for recording the speed of the car, about as large as an ordinary clock, occupies a place between the windows, on one side of the room. A carpet of rich material covers the floor.



FLOOR PLAN OF THE CAR "RAILWAY AGE."

From the observation room we pass into a hall and turn first into the Private Room, which is 7×8 feet, and finished in maple and amaranth. An elegant full-sized folding bed, also made of these choice woods, occupies one side of this room, and opposite this a large mirror is set in a door which opens into the Ladies' Toilet Room, with which the Private Room is connected. A couple of silver-plated side lamps furnish light at night, and two windows render like service during the day.

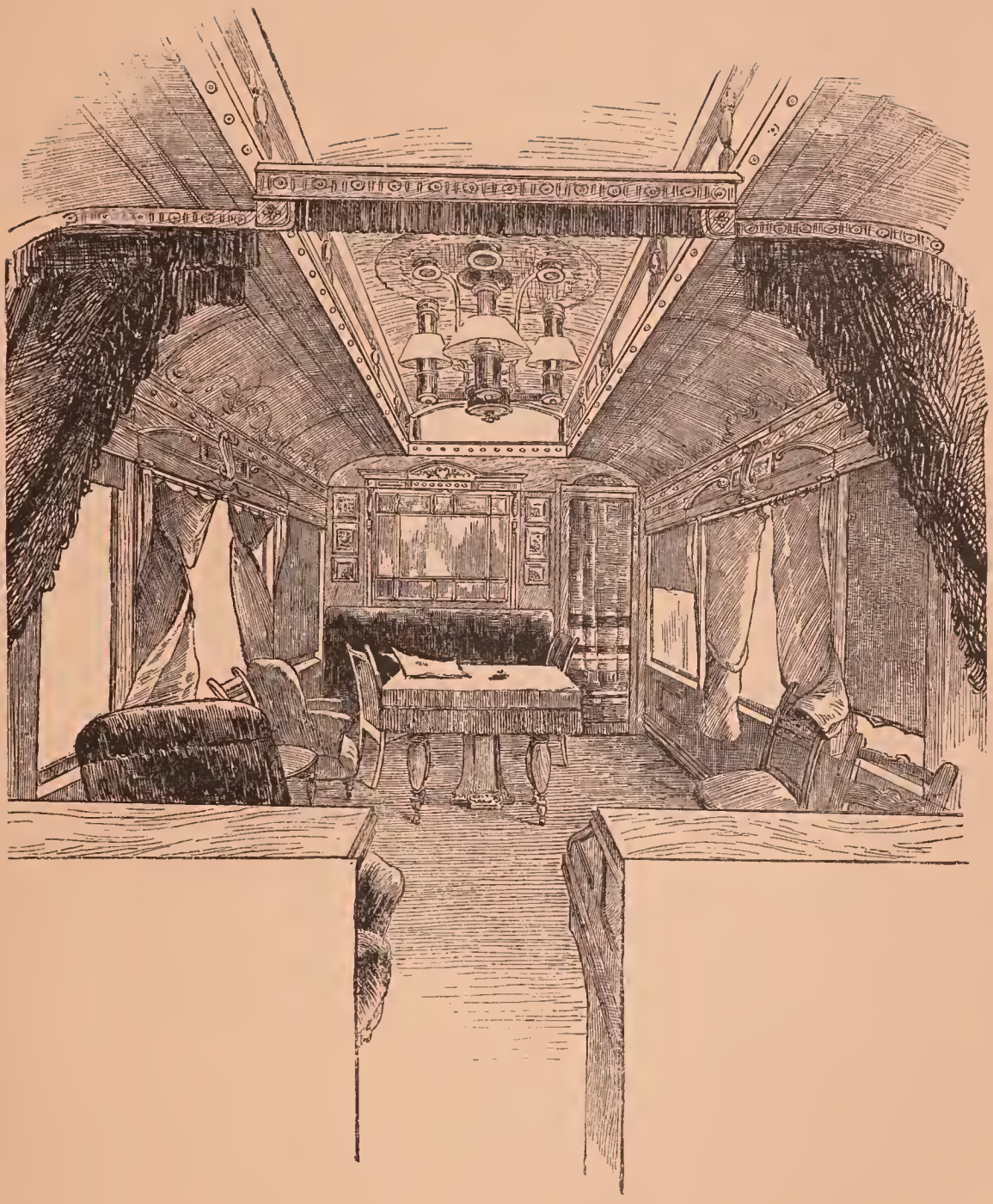


In the Observation Room.

A Cozy Corner.

The Toilet Room referred to is 5×7 feet and finished in like material and style, and is as complete as skill could make it. It contains three large wardrobes for ladies' wearing apparel, extending entirely across one side, the front of the center one being a mirror, 22×48 inches; a complete washstand, equipped with finest Tennessee variegated marble, a double-acting pump, a large mirror, a silver-plated side lamp, two windows and about every other desirable convenience. A superb Axminster carpet covers the floors of both these rooms.

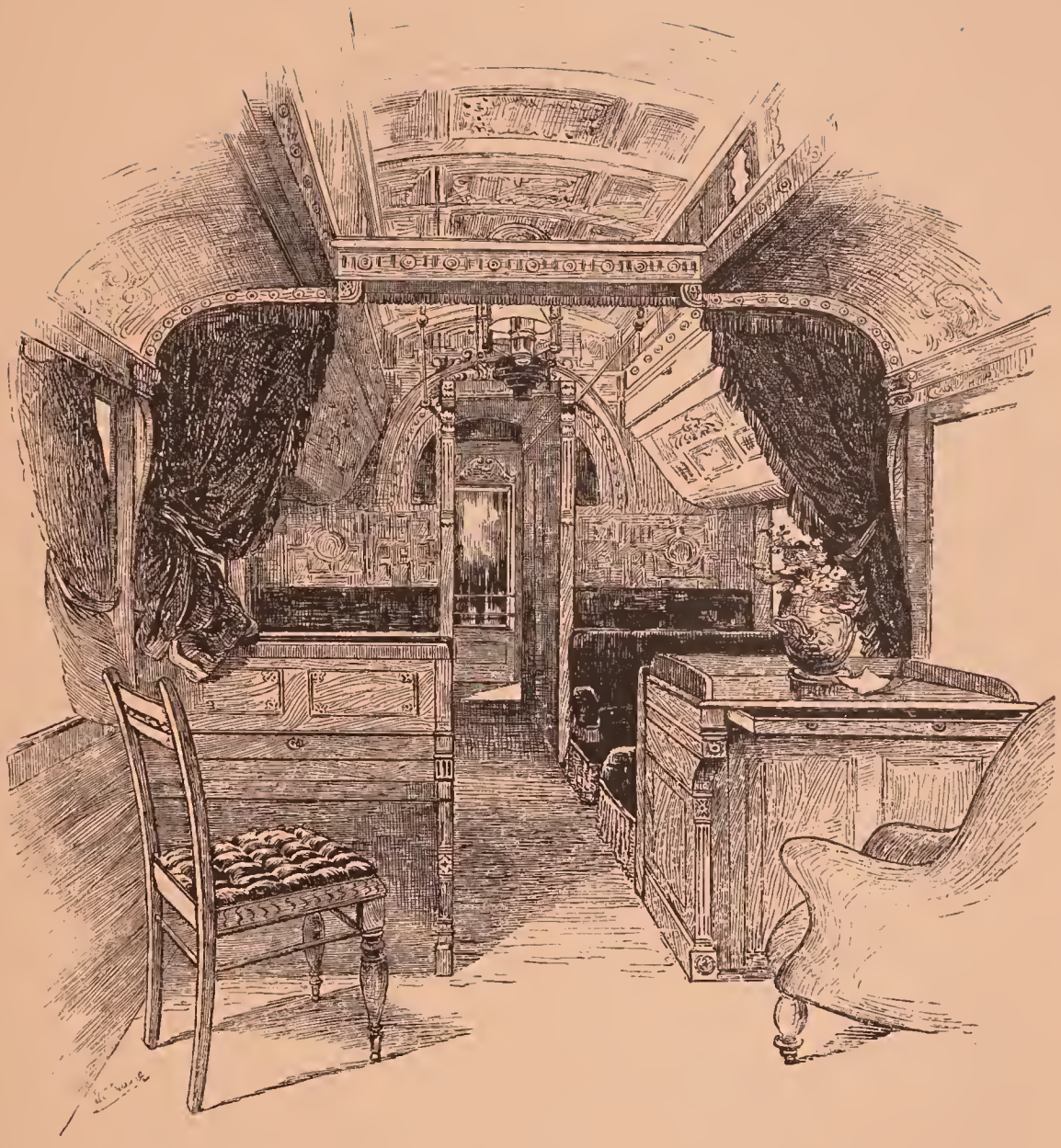
Passing again into the hall, which is also finished in maple and amaranth, we next enter, through a richly draped door, the Parlor, which is probably the most noticeable feature of the car. This is sixteen feet in length, extending across the car, and is finished in mahogany, with panels of rare woods from almost every country producing them, worked into novel designs representing the modern ideas of this class of interior ornamentation. At one end of the Parlor is a beveled mirror, 22×31 inches, surrounded by twelve smaller ones, also beveled, the whole framed in mahogany, with moulded cornice, carved in the most elaborate manner. At each side are ornamental panels of various fine woods, in marquetry. Under this mirror is a large sofa, upholstered in richest velure, which at night is transformed into a sleeping section, the back being raised and supported upon two brackets which in day time are not seen, a heavy tapestry curtain surrounding it when used as a sleeping compartment. Above the whole, snugly ensconced in the transom, is a beautiful clock. A mahogany extension table, used both for dining and reading purposes, occupies the center of the room, and about it are carelessly placed two richly upholstered easy chairs and a number of smaller ones. At each side of the Parlor are two large windows, 32×43 inches, with smaller ones on either side, and a beveled mirror, 21×40 inches, between. Each of these larger windows is capped by an elaborate entablature with panels of rare woods and rich carving.



THE PARLOR.

The pedestals on which these mirrors rest are surrounded by little silver-plated railings, which serve both as a protection and as a receptacle for flowers or other ornaments. The large windows are richly draped from silver-plated rods, the smaller ones having curtains suspended from rollers as in sleeping cars, and being surmounted by a little railing or balcony of turned spindles, affording another receptacle for flowers when it may be desired to decorate the car. Against the back of the seat of one of the sections, and just under the beautiful drapery which separates the Parlor from the Sections, is a very ornamental as well as useful mahogany writing desk, through the top of which project three brass tubes, extending a number of inches high and supporting finely finished sectional representations in brass of the principal working parts of the Westinghouse Air Brake, referred to at length in another part of this volume.

After the Parlor come the Sections, two in number, which are entered through a most tastefully designed arch of richest drapery, and which are upholstered in velure. The backs of the seats are ten inches higher than in sleeping cars, and the rich fringe attached to the upholstering extends to the floor. The fronts of the upper berths have numerous small panels and a number of appropriate carved figures of various rare woods, worked in so as to produce a most pleasing effect, and are exquisitely designed. The bulkhead partition, which separates the Sections from the working department, shows in its design some very novel and pleasant features, the principal one being the employment of an imposing arch, sprung from the backs of two section seats and passing over the door. In this arch are introduced rich moulding and very fine carving and blocking, in small panels. The door of this bulkhead contains a richly embossed light of glass, 17×44 inches. Through this door we pass to what may be appropriately termed the working department, the first object which attracts attention being a large silver-plated water cooler occupying a niche in the left side of the pasage and standing on a highly polished slab of Tennessee marble. Opposite this is a large linen locker, next the Heater, which is highly ornamented in nickel, forming an attractive contrast to the Russia iron; opposite this, the Gentlemen's Toilet Room, supplied with a beautiful Tennessee marble wash basin, a double-acting pump, a silver-plated side lamp and other conveniences, and next a locker for the storage of supplies. This brings us to the partition enclosing the butler's pantry and the Kitchen, in the first of which is a beveled French plate mirror, 20×58 inches — the largest in the car,— the frame of which is moulded and carved in a most tasteful manner, and over which is a richly carved entablature, the whole conforming to the other furnishings of this part of the car.



THE SECTIONS.

Following the passage-way, around this partition, the butler's pantry is next entered. This important department contains a remarkably complete refrigerator, made of fine woods, with double plate glass doors, through which its tempting contents are visible; numerous little lockers, drawers, shelves and hooks, for the storage of dishes and the smaller supplies required on long journeys, a marble sink in which to wash glassware, and a silver-plated side lamp.

Last, but by no means least in importance, is the Kitchen, which is entered through a door adjoining the rear door of the car, and which is believed to be the most compact, and at the same time complete in all its appointments, ever placed in a railway car. One side of the room is occupied by a cooking range and broiler, finished in nickel and black, the ornamentation being from original designs. These contain compartments for cooking and baking all articles required for the table, as well as for keeping them hot and in perfect condition for use. The floor is covered with copper sheeting. About the room are suspended the various articles required by the autocrat of the kitchen, every available inch of space both here and in the butler's pantry being put to some practical use. A sliding window in the partition which separates the kitchen from the butler's pantry, is used by the cook and the waiters through which to pass the viands and dishes. To the ladies, at least, this department will doubtless possess greater interest than any other, as it is certainly a model in its way.

The ceiling, which is one of the most noticeable features of the car, must not be overlooked. In its designing great taste and much originality have been displayed. The material of which it is made is principally maple, with here and there a figure in some other variety of fine wood, and the decoration is in gold and pale colors, the general effect being exceedingly pleasing.

The finish of that part of the car between the sections and the rear end consists of selected black walnut, with French walnut veneers.

The visitor has now been shown through every nook and corner of this magnificent specimen of the art of modern car building, and will not, we feel sure, fail to give full credit, in proper proportions, to Pullman's Palace Car Company, to the toilers whose hands wrought the work, and to the manufacturers who supplied the almost innumerable articles required in its construction and furnishing, for the grand result accomplished in the production of *The Railway Age Car*.

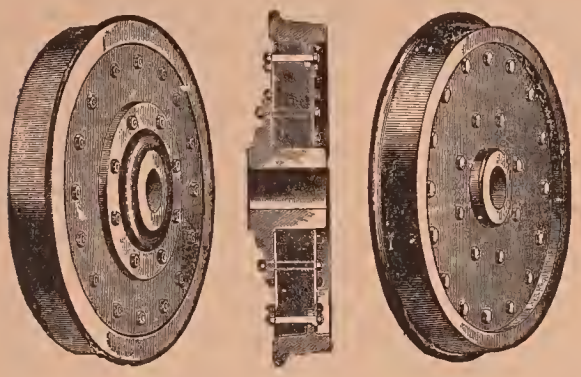
In the succeeding pages will be found more extended reference to the various articles which have here necessarily had only brief mention.

THE EQUIPMENT.

THE WHEELS.

TENS of thousands of railway travelers are every day whirled over the country at a high rate of speed, upon discs of paper made out of rye straw. The idea of using paper for car wheels, which dates back only a few years, always strikes the uninformed as strange and almost paradoxical. But a little reflection will show that a wheel composed of many sheets of straw board glued and pressed together under tremendous hydraulic power, must form a substance impossible to break like metal, or to split like wood, while at the same time possessing a slightly elastic property which naturally tends to deaden the blow when rapidly revolving upon rails. The wonderful invention of the Allen Paper Car Wheel consists in the use of this material for the core of the wheel, the paper being surrounded by heavy steel tires of the most expensive and perfect manufacture, while the axle plays in an iron hub securely fastened in the center. This gives a wheel consisting of a combination of paper, steel and iron so thoroughly fastened together as to be incapable of separation in any conceivable accident, and combining the unbreakable quality of the paper fiber with the best characteristics of the metals named. The result seems to be safety and durability in the very highest degree. The paper wheel has, during the ten years that it has been in use, developed extraordinary mileage, in many cases maintaining from 100,000 to 200,000 miles without turning the tire, and from 400,000 to 800,000 without renewing the tire. It has also effected a great saving in axles by reducing the jar and thus preventing crystallization and disintegration of the metal. This result, of course, produces another highly important result, the diminution of wear and tear of track, roadway, and rolling stock, so that while the first requisite — the safety of travelers — is almost absolutely secured so far as the wheels are concerned, by the use of this invention, the economy of maintenance is very materially promoted.

The success of this device is shown by the fact that the company manufacturing the wheel has grown in a few years to be a great corporation, with extensive works at Pullman, Ill., Morris, Ill., and Hudson, N. Y., and that recent enlargements have given it the vast productive capacity of 25,000 wheels a year. One of the advantages claimed for the forty-two inch paper-wheel is, that on account of its large size, as well as the characteristics resulting from the use of paper, four wheel trucks under passenger cars, in place of six wheel trucks, are practicable, because of the great diminution of the weight without affecting the safety or smoothness of running.



The paper-wheel is certainly one of the handsomest made, in appearance, especially the large size just referred to, and adds greatly to the general effect produced by that most important feature of any car, the "running gear." The peculiar construction of the wheel is illustrated by the little cut herewith given.

THE TIRES.

The tires with which the twelve paper wheels under this car are equipped were furnished by the Midvale Steel Company, of Philadelphia, and Fried. Krupp, of Essen, Germany,—each of these great concerns supplying six. It is believed that a comparison of the results of prolonged use of these tires will prove to be very interesting and instructive in establishing the relative merits of the home and foreign article, as here exhibited by these representative manufacturers of the two countries. The employment of steel by American railways for this purpose is of comparatively recent origin, and has grown in the estimation of all railway officials and metallurgists until now almost all first-class rolling stock, from the locomotive to the rear car of the train, is equipped with wheels which are supplied with tires made of the very best steel. There are so many elements of safety in steel over iron, when used for this purpose, to say nothing of the much greater wear to be derived from it, that, as a question of economy, it is coming to be regarded as far preferable in very nearly if not quite all respects which have a bearing upon the safety of travel and the economy of railway operation.

The works of the Midvale Steel Company, located at Nicetown, near Philadelphia, are the most extensive and most complete in this country,

and have long since acquired a reputation for their product of which the practical test given it by long use is thoroughly confirmatory. Every tire and every axle turned out by this establishment is submitted to the most thorough test, both while in the raw material and after it has been finished, none being allowed to go into use in which there is discovered the smallest possible flaw or imperfection; and the result is that one of them is very seldom broken.

For ten years past, the management of the Midvale Steel Company has held that, in the manufacture of steel, it is of the first and highest importance to be able to *reproduce* with accuracy any grade of steel which has been found best suited to a given purpose. With this in view, it has spared no pains to maintain a high degree of thoroughness and excellence in the following points:

First: An accurate knowledge of the composition of all raw material used, by constant and systematic chemical examinations.

Second: Such careful melting of the material as to insure the soundest possible ingots, consistent with a proper composition.

Third: The accurate determination of the chemical and physical characteristics of products, and the classification of the same thereby.

Fourth: An intelligent and careful working of the steel at the hammer and rolls, with a view of turning out the metal, in the finished product, in the best possible condition.

Fifth: Such constant testing of the finished products as to furnish knowledge of the physical properties of the same.

The above principles of manufacture having been applied to the product of the Midvale Steel Company, it claims superior excellence in the following respects:

FOR LOCOMOTIVE AND CAR WHEEL TIRES.

First: Great uniformity in composition, their hardness being carefully regulated according to the size of the tires, and the use to which they are to be put.

Second: Soundness of the ingots from which they are made; which insures clean treads and good wearing qualities.

Third: Careful and accurate rolling; by which the tires leave the mill in the best condition for strength, and so round and true to size that, in some cases, they can be put into service without turning.

Fourth: High quality of the metal in the finished tire; as indicated by test bar cut from the center of a section, in the direction of its circumference, which shows a tensile strength of 103,000 lbs. to the square inch; 15½ per cent elongation, and 24.14 per cent contraction.

Fifth: An exceptionally good record in the matter of wear, and small number of breakages.

FOR LOCOMOTIVE AND CAR AXLES.

It is claimed that the metal used in their manufacture is selected with great care, and after thorough testing. These axles are made of two distinct grades of metal, a softer or harder, according to the preference of customers. The high quality of the softer grade was shown by the master car-builder's axle seen in this company's exhibit at the National Railway Exposition, which sustained, without breaking, a drop-test of five blows of a 1700-lb. drop falling 25 feet, and twenty-five blows falling 30 feet, the axle being supported between bearings three feet apart, and turned over after each blow. The harder grade of steel is represented by the master car-builders' and Pennsylvania railroad passenger car axles, also exhibited at the Railway Exposition, from which test bars were cut from each wheel seat, half way between center and outside, showing a tensile strength of from 75,000 to 85,000 lbs. per square inch; an elongation, after fracture, of from 22 to 26 per cent, and a contraction, at point of fracture, of from 39 to 48 per cent.

Of the Krupp works little need be said. They are the most extensive in the world, and have a reputation which extends very nearly over the world. A large percentage of their product comes to this country, and will doubtless continue to do so, at least until the facilities here for producing steel tires and axles have been greatly enlarged and made sufficiently extensive to supply the increasing demand. Long and widespread use on prominent railways, under first-class rolling stock, has given Krupp steel a record which is as free from flaw or defect of any kind as is the metal itself. Probably no manufacturing establishment of its class in existence is so widely known, or has distributed its product over such vast expanse of territory and acquired a reputation so world-wide.

The American representatives of the Krupp works are Messrs. Thomas Prosser & Son, of 15 Gold street, New York, whose reputation for business integrity is unquestioned and of long standing.

Just in proportion to the increased use of steel axles and tires will the safety of railway travel be augmented, and no influence can so far aid in bringing about the greatly-to-be-desired transformation as the excellence of the material and work furnished our railways by the two great concerns named. These must be the educators that are to work this transformation, and that they are accomplishing it in a most creditable manner there is no doubt.

THE SPRINGS.

The important part in the service of a car which is performed by the springs cannot be overestimated. It is true they do not attract the attention which is bestowed by the curious upon many articles of far less consequence, but no other exerts so great an influence upon the comfort of those who travel by rail. An imperfect equipment of springs results in a jerky, or trembling, or unsteady motion which ought to be a sufficient infliction to cause its immediate retirement from service, and the substitution of a first-class article. An evenly tempered set of springs, made of the very best steel (and no other should be used), adapted by a careful calculation of the weight and character of the load to be carried by the particular car under which it is intended to be placed, each member of the set being of precisely the same weight, quality and capacity, is certain to attract an earnest commendation from every traveler who rides above them, and who knows anything of the important part they are intended to perform in rendering his journey safe and comfortable.

If the reader could but examine a car or locomotive spring of thirty or forty years ago and compare it with those of the present day, he would be astonished at the wonderful progress shown. In design, in quality of metal, in finish, in everything, the fruits of inventive genius and mechanical skill, guided by practical experience and close observation, are manifest. This great advancement is largely the result, too, of the encouragement to be found in a growing disposition on the part of American railway managers, master car builders and purchasing agents to use only the best material attainable. These officials are wisely giving more and more heed, as the years come and go, to the principle, long since become an adage, that "the best is the cheapest," and the result is not only a better spring than was dreamed of twenty years ago, but the best rolling stock, in every respect, in the world.

In railway operation, experience, which is in no other department of commercial or business life a more effective school, is unquestionably teaching this fact, and the sooner it is universally admitted the better will it be for those whose money is invested in railway property. There is nothing to gain and everything to lose by using anything but the best, and this applies to every appliance used in railway construction or operation, from the humble bolt in the track to the finished car or locomotive.

In spring making, as in every other business, the conduct of which requires mechanical skill and a knowledge of the material used, constant experimenting and the most careful study of the needs which are intended to be met are necessary. No man in America more thoroughly appre-

ciates this fact than does Mr. Aaron French, the head of the great Pittsburgh concern whose springs are under the *Railway Age* car. Before railway building in the West had created a demand for the skill and genius which he possessed, he was engaged in the manufacture of stage-coach springs in the little town of Racine, Wisconsin, and in this humble occupation was steadily winning a reputation for superior work and honest material, which, on the approach of the railways was wisely turned to profitable account. He saw in the needs of the railways a golden opportunity and he promptly accepted the challenge. The skill that had rendered his work famous with stage-coach owners and travelers was needed in the new and more extended field. That he has most creditably employed it, both railway managers and the traveling public will cheerfully testify. His product is known wherever railway trains are seen, and its superiority is recognized as universally as is that of the air brake, the Pullman sleeper or the steel rail.

The works of A. French & Co. and the French Spiral Spring Company, which organizations are largely identical, are among the most prominent industries of the great manufacturing city of Pittsburgh. Their construction has been after the most carefully devised plans, and economy of time and labor, rapidity of execution and a systematic arrangement of the large number of machines employed, make it an easy matter to dispatch work with great precision and promptness.

The elliptic springs with which this car is equipped were made especially for it by A. French & Co., and the spiral or bearing springs, by the French Spiral Spring Company, and are from the finest steel produced in this country. The traveler who has the good fortune to ride in a car resting upon such springs, may at least depend on absolute comfort and safety in so far as this feature of his surroundings is concerned.

In few respects has there been greater improvement in the past twenty or thirty years in matters connected with railway appliances than in the character of the springs used both in passenger and freight equipment. It has been constant, unfaltering and marked. That the springs under this car combine all the improvements as to design, material and manufacture made by Mr. French, in all these years is a fact which is expected to crown them with a record that will long outlive the car itself.

THE JOURNAL BEARINGS.

These are not an unimportant feature of the running gear of a car by any means. There have been many different combinations of metals suggested for the purpose and not a few have been patented, but none

seem to have acquired higher rank than that patented by D. A. Hopkins and manufactured by Geo. R. Meneely & Co., of West Troy, N. Y., from whose well-known establishment came the bearings which are doing service under the *Railway Age* car. These are made of brass with soft metal so imbedded in them that they fit themselves to the journal, wearing smoothly and evenly, always protecting rather than injuring it, and avoiding that most serious trouble, heating. In addition to its West Troy works, this concern, which consists of Geo. R. Meneely and T. W. Getman, operates an important branch at Atlanta, Georgia.

THE WESTINGHOUSE AUTOMATIC BRAKE.

Perhaps no more wonderful improvement has been made in railway appliances within the past few years, than that indicated by the substitution for the old fashioned hand brake, requiring a man on each car and then often working very imperfectly, of the wonderful automatic brake apparatus which places in the hands of the engineer the ability to apply the full power of steam and to immediately stop the train. Many inventors have long struggled with the difficult problem of using the same power which impels the train, to stop it. A number have succeeded, and there are three or four kinds of power brakes now in operation. The name of George Westinghouse, Jr., is known world wide in connection with his long continued and now splendidly successful effort to construct an automatic air brake. The first patent for a "compressed air" brake was issued to Mr. Westinghouse, April 13, 1869, and the present automatic brake, which seems to have reached the limit of perfection, is the result of continued study and experiments indicated by nearly 100 patents. The Westinghouse brakes first in use were non-automatic, that is, would not operate of their own accord should the train part or a pipe break. The automatic brake which is now fast being substituted for its predecessor is a beautiful example of instantaneous and accurate self action. This brake can be applied and released instantly, and will stop the train under full headway in about its own length. It can be applied from any part of the train, by any employe as well as by the engineer, and is applied instantly with its full force to every vehicle if the train breaks in two, or if any accident occurs to the apparatus, such as a ruptured pipe or hose, causing sufficient damage to render a non-automatic brake powerless. The principle upon which this wonderful device operates is not only exhibited in the full sized brake attached to the car now being described, but is admirably shown to the passenger by the ingenious model in the car itself. A mahogany writing

desk encloses the working parts, which are easily reached for examination, and extending through and above this desk a few inches are several brass tubes, showing sections of the apparatus and their working as the brake is applied and released. This very interesting model was prepared expressly for this car, nothing of the kind having before been made. An examination of its smooth and noiseless working as the train starts and stops gives the traveler a new admiration of the genius which has placed the train, in case of danger or necessity, so completely in the hands of the man at the front — the engineer.

It may be well to state that the Westinghouse air brake is composed of eight essential parts, as follows:

1st. *The steam engine and pump*, which produce the compressed air.

2d. *The main reservoir*, in which the compressed air is stored.

3d. *The engineer's brake valve*, which regulates the flow of air from the main reservoir into the brake pipe for releasing the brakes, and from the brake pipe to the atmosphere for applying the brakes.

4th. *The main brake pipe*, which leads from the main reservoir to the engineer's brake valve, and thence along the train, supplying the apparatus on each vehicle with air.

5th. *The auxiliary reservoir*, which takes a supply of air from the main reservoir, through the brake pipe, and stores it for use on its own vehicle.

6th. *The brake cylinder*, which has its piston rod attached to the brake levers in such a manner that when the piston is forced out by air pressure the brakes are applied.

7th. *The triple valve*, which connects the brake pipe to the auxiliary reservoir, and connects the latter to the brake cylinder, and is operated by a sudden variation of pressure in the brake pipe, so as (1) to admit air from the auxiliary reservoir to the brake cylinder, which applies the brakes, at the same time cutting off the communication from the brake pipe to the auxiliary reservoir; or (2) to restore the supply from the brake pipe to the auxiliary reservoir, at the same time letting the air in the brake cylinder escape, which releases the brakes.

8th. *The couplings*, which are attached to flexible hose and connect the brake pipe from one vehicle to another.

The Westinghouse Air Brake Company is officered as follows: President, George Westinghouse, Jr.; secretary, W. W. Card; assistant secretary, S. H. Sprague; treasurer and purchaser, John Calwell; general agent, H. H. Westinghouse; superintendent, T. W. Welsh. The brake is also represented in Great Britain by a strong company and has already been introduced on many of the great railway lines in Europe, in spite

of the fact that there are several European devices claiming to accomplish the same end,—a high tribute to the excellence of the Westinghouse apparatus.

BRAKE SHOES.

The metal shoes which intervene between the brakes and the wheels, seem of trifling importance to the ordinary observer, and yet they are absolutely indispensable to safety. The Westinghouse brake itself might be almost inoperative if the brake shoes did not hold. As a tremendous amount of work is required of them, it is of great importance to secure metal that will stand long service, and at the same time not grind the wheel unduly. The Congdon brake shoe is the result of a happy idea of combining the advantages of wrought iron and cast iron respectively in the same shoe, by making it of pieces of both kinds, which has been found to result in very great working ability,—better than either wrought or cast iron separately. The long life of this shoe is its best recommendation, and has established for it a record which only merit can establish.

THE PLATFORM RAILINGS AND GATES.

The broad platforms of this car, from which it will often be found pleasant to take a view of the passing scenery, are protected by strong and yet elegant steel railings, which, it is safe to say, have never been equaled on a railway car. The entire railings, including three gates at each end, are heavily plated with nickel, and will stand wear and exposure for years without serious injury. The ornamentation, it will be seen, consists of a combination of scrolls which are worked into the wrought iron, and are from original designs prepared expressly for this purpose. It will be admitted that they reflect great credit upon the taste of the manufacturer, Mr. E. T. Barnum, of Detroit, Mich. Mr. Barnum manufactures all kinds of wire railings for banks, offices, theaters, house piazzas and stairways, balconies for public buildings, window guards, from the smallest used for private residences, to the heaviest wrought iron guards for prisons and asylums, wrought iron stair and area railings, fire places and stove grates, wire flower pot stands, wrought iron bedsteads with woven wire mattresses, iron cresting or roof railing, wrought iron fences with elaborate ornamentation, cast iron fences, hitching posts, etc. A visit to Mr. Barnum's extensive establishment, or an examination of his elaborate catalogue, gives new ideas of the innumerable uses to which wire and light iron can be applied.

PLATFORM LIGHTING.

One of the "new things under the sun," is the lamp which occupies a place in the center of the hood at each end of the car, and at night lights the platforms and steps. That it is a protection of much importance a trip which includes a dark night or two will very forcibly illustrate. The danger which attaches to the act of passing from one car to another, or to getting on and off a car in the night time is largely obviated by this simple invention. It is supplied with a reflector and is so constructed as to perfectly light the platform and steps the darkest night. The inventor and manufacturer is Mr. E. G. Windsor, of Providence, Rhode Island, to whose close observation and well directed efforts the traveling public will soon acknowledge a debt of obligation.

COUPLER AND BUFFER.

The coupler and buffer used on this car were supplied by the extensive establishment of McConway, Torley & Co., of Pittsburgh, and are known as the "Janney-Miller Combination." The especial advantages of this combination consist in the fact that it can be used on roads which have adopted either the Miller or Janney, equally well, and is suited to crooked as well as straight track. Its elements of safety are most highly commended in railway circles. At the recent National Exposition of Railway Appliances, this coupler was awarded the premium—the only one given any coupler—and received much merited praise. The high reputation of all work done for railways by McConway, Torley & Co. is as extended as are their vast business relations.

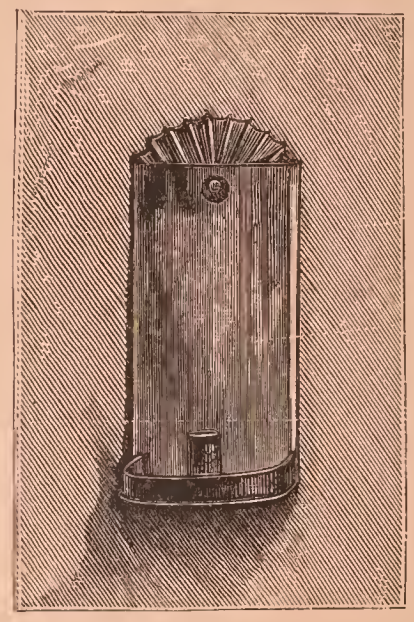
THE ARTIFICIAL LIGHTING OF CARS.

In few particulars has there been so great advancement in providing needed comforts and conveniencies for those who travel, as in the matter of lighting cars.

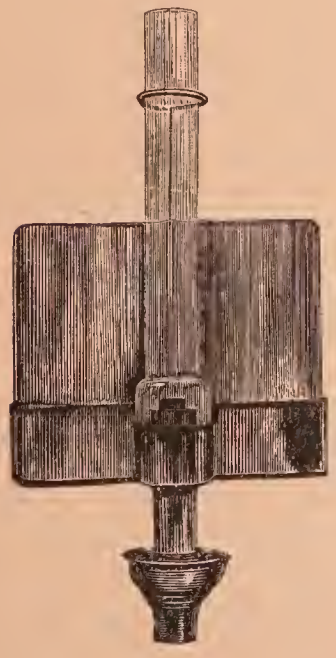
We all remember (and it is not a particularly pleasant remembrance either) when it was evidently regarded necessary to provide only sufficient light to enable passengers coming into cars or leaving them at night, to grope their way to and from their seats. So dark were cars kept that the robbery of passengers by thieves seated with or near them was of frequent occurrence, and reading during the evening hours was a pleasure not to be thought of. They were gloomy cages in which men and women endured voluntary imprisonment for a brief period because necessity compelled them to travel, and they preferred even this means

to the greatly less comfortable one provided by the crowded, stuffy, rocking old stage coach. In those days night or even evening travel was not engaged in for pleasure, the comforts of the sleeping car being then almost as far away in the future as were those which are found in a cheerful light.

The candle (tallow, doubtless) was the first means provided for lighting cars, and for years reigned supreme there as it did at the firesides of our ancestors. Mr. J. McGregor Adams, president of the Adams & Westlake Manufacturing Company, who manifests a deep interest in the early history of those railway appliances which pertain to the interior furnishing or ornamenting of cars, has kindly permitted the use of several old relics in his possession, from which the illustrations herewith are engraved. They show, in a most forcible way, from what an humble beginning the beautiful and effective car lamps now used have sprung, and how rapid the progress has been. These, or almost exactly similar lamps, were used on the older railways a number of years, and doubtless impressed the traveler with their then unequaled merits as fully as does the best Hicks & Smith, Adams & Westlake, Post & Co. or Williams & Page production that in these modern days (or nights rather) contributes to the comfort of our exacting traveler in a modern palace on wheels. It is fortunate that our appreciation is lavished upon what we have, rather than upon what inventive genius is ever promising us.



Car Light Previous to Introduction of Oil.



Oil Side Lamp — Central of Georgia R. R. Prior to 1850.

The firm of Williams, Page & Co., of Boston, which was organized as dealers in general railway supplies nearly thirty years ago, claims to have invented and manufactured the first car lamps for burning kerosene or mineral oils, and the first hanging lamps for Monitor cars. There was such a strong prejudice on the part both of the public and the railway companies against the use of kerosene, however, that this firm for a time abandoned the oil

lamp, and devoted its attention to perfecting a candle lamp to burn a large paraffine candle having a one inch flat wick, and which is said to have given a very clear and satisfactory light. The Downer Kerosene Oil Company, of Boston, a little later conceived the idea that if paraffine gave so good a light in the form of a candle, it or some similar substance in liquid form might be made to still more satisfactorily answer the purpose. Hence the origin of mineral sperm, or 300° fire test oil, now so largely used for lighting railway cars and steamships. There being at the time no suitable burner for this oil, Williams, Page & Co. commenced experimenting and finally produced the first two-tubed or dual burner, which is still very generally used. They were likewise the first to manufacture and introduce the two-light lamp for cars, and lamps for burning 300° fire test oil on ocean steamers, having fitted up the Cunard Line with them many years ago, and subsequently various other lines. The beautiful two-burner ceiling lamp in the observation room of this car was furnished by this company.

The New York house of Hicks & Smith is entitled to grateful remembrance from the public as one of the first, if not the first, to introduce lamps in railway cars, of sufficient illuminating power to enable a traveler to read with ease and comfort. The large four-burner lamp in the parlor, and the two-burner and other lamps in other parts of the car, which this house supplies, are in wonderful contrast with the dismal tallow candle which long furnished the only illumination in railway cars, even of the most costly kind.

Messrs. Hicks & Smith are exclusively engaged in the manufacture of railway and steamer lamps, and their trade is co-extensive with the railways of the country. Their persistent experiments in the matter of car lighting, extending over a long period and under all the various circumstances of climate, peculiarities of car construction, currents and counter-currents of air, and other conditions which influence the behavior of a lamp, have been of great service to the railways and to the traveling public, for to these experiments is largely due the progress to which we have referred, in the very important matter of car lighting.

The beautiful lamps between the sections and in the private room of this car, are furnished by The Adams & Westlake Manufacturing Company. This company is a Chicago institution, and very widely known in railway circles. Its immense works, at Chicago, annually turn out a great number of passenger, parlor, and postal car lamps, in brass, bronze, fire gilt, silver and nickel-plate, locomotive headlights, lanterns of all kinds, switch, signal and station lamps, as well as lenses

for semaphores, headlight reflectors, telegraph signals, window ventilators, and a long list of other railway specialties. A glance through its various departments furnishes a striking illustration of the value of systematic organization, superior mechanical talent, the very best machinery, and intelligent industry in the conduct of a great manufacturing enterprise.

The well known firm of Post & Co., railway supply manufacturers and dealers, located at Cincinnati, and enjoying a trade which extends throughout the country, especially in the West and Southwest, furnishes a two-burner lamp near one end of the car, and a bracket lamp in the kitchen. They manufacture lamps for railway cars, offices, stations, switches and trains; lamp goods, locomotive headlights, car trimmings, electric light lamps, telegraph and telephone instruments, and deal in railway and telegraph and telephone supplies of every description. The officers of the company, which was incorporated in 1869, are as follows: President, Joseph Kinsey; vice-president and general manager, E. V. Cherry; secretary, Oliver Kinsey, Jr.; assistant superintendent of works, Charles Anderson.

The company's manufactory is one of the most extensive in the country, and the line of goods manufactured includes a vast number of articles used by railways, numbering, besides those above enumerated, all brass, bronze, and silver and nickel-plated goods belonging to car doors and windows and general interior furnishings.

FINE WOODS AND VENEERS.

Nothing in connection with the interior finish of cars, public buildings or residences exerts so important a part as do the fine woods. There is something honest and substantial in panels or casings or ceilings composed of beautiful sections of walnut, cherry, maple, ash, rosewood, mahogany, amaranth and others of the choice woods which the forests of the world produce, and which are rapidly being wasted away and are growing more and more expensive. The E. D. Albro Company, of Cincinnati, makes a specialty of securing from the splendid forests of the South and from foreign lands a vast variety of fine woods, and working them into various forms, from heavy paneling to thin veneer, for interior finish and ornamentation. The woods which this company has contributed for this car, and which constitute a most important feature of its attractiveness, include the following varieties: mahogany, from Mexico and San Domingo; amaranth, from Brazil; palo gateado, from Peru; cedar, from Mexico; tulip, from Ceylon; olive, from the Holy Land; rosewood, from

Brazil; amboyne and thuya, from the West Indies; ebony, from Madagascar; walnut, from Persia; cedar, from Florida; poplar, oak, ash, maple, cherry, and black walnut, from the northern states.

The firm above referred to deals directly with exporters, sending one or more of its members to Europe, Asia, South America and Mexico annually to make purchases. Its establishment at Cincinnati is certainly the largest of the kind in this country, and probably is not excelled in the world. Its trade extends into Mexico, Norway, England, Germany, Belgium and France.

Every clime now pays tribute to the luxury and good taste of the public in the use of rare and costly woods for beautifying homes and their furnishings, and the general adaptation of native and foreign woods for this purpose here in America indicates a sure advance to the position which many of the older civilized nations of the earth attained in the long ago in this direction.

One pleasant feature of this advanced step is the substitution of a natural wood finish in interior work for poor graining and worse painting. The American people are awakening to those truths in art which nature teaches, and which the art workers of by-gone centuries have exemplified in the descriptions and in the relics handed down to us, from the building of Solomon's Temple, from the Arabs and from the Moors in Spain, the ancient carvings of Tuscany and mercantile Venice, and later still the furniture of the French Louis and the Anglo-Saxon wood finish of the times of Elizabeth and Queen Anne.

The development of the artistic use of finely grained woods for interior decoration in this country is confined to this generation. Our fathers used it to a limited extent only. The builders of passenger cars were the first to use wood entirely and in its natural state for interior finish.

The steamboat was an educator in one direction; the railway car has been in another. The garish interior of the steamboat, gorgeous with paint, gilding and plate glass, has its influence upon the traveler, as we have seen by its less ornate reflection in numerous western homes. But it was left to the railway car to popularize the purity of finish which is derived from natural surfaces. The railways have kept pace with the people in their demands for the luxuries and conveniences of our modern life, and from the plain cars used by our plain ancestors we have advanced to the beautiful interiors of native and foreign rare woods, of varied colors, shades and markings, brought to the highest state of finish by the deft hand of the modern car builder.

Strength, derived from the heat and luxuriant growth of the tropics, is indicated by strong color and firm tracery, while specimens from the

"lands of snow" seem to reflect with their lighter tints and fainter tracery the cool atmosphere in which they grow.

THE PAINTING AND COLORING.

An unpainted car would be a very unattractive object, no matter how fine the interior or exterior workmanship and finish. A car painted in bad taste or with cheap colors, easily rubbing off and losing their hues, would destroy the beauty of the workmanship and fittings. The painting of railway cars is almost one of the fine arts, so much skill is necessary in the selection of the very best materials, which will stand the severe exposure through all kinds of weather to which cars are subjected, and in the tasteful and harmonious blending of colors and shades.

The paint and colors used on this car, and which cannot but receive universal admiration, are from the widely known house of Sherwin, Williams & Co., of Cleveland and Chicago, whose business has been kept, during the past ten years, fully apace with the demand, not only as to the quantity of product, but the constantly changing and advancing ideas with reference to the painting and ornamentation of railway cars. Only an energetic and progressive policy can, in these times, maintain supremacy in any line of business, and especially in the supplying of paints and colors for first-class passenger equipment. That the firm herein named has succeeded in holding such a position through these exacting years, is abundant evidence of the worth of its product. As a natural result, it has been found necessary to make large additions to its works from year to year; the most important, probably, in its history, having been made during 1882.

In the manufacture of paints and colors to be used in railway cars, there are many things to be considered which do not enter into the supplying of any other branch of this very important business. Chief among these is the matter of climate, the requirements and effects of which are as widely different in different localities, as are the tastes of those who control the purchase and use of these goods. What will best answer the purpose in the shaded East, is wholly unfit for use in the great plains of the far West; and there are natural conditions to be considered in the regions of alkali, scorching sands and almost perpetual wind, that do not exist where the earth is covered with verdure and the climate is more equable. Then, too, many cars are employed in "runs" of such great length as to include almost all these extremes, rendering necessary the most careful and scientific combinations of qualities, colors and shades. Add to all these difficulties the fact that almost every railway has a

"standard" of its own, which differs materially from that of almost every other road, and it is easy to form some idea of the manifold and exacting requirements of the railway branch of the trade in paints and colors.

The quiet, attractive color and beautiful finish shown in this car are pointed to with more than common pride. It has been especially named the "Talbott Blue," and under this name has been added to the manufacturers' list of car colors, and offered to the railway public.

THE VARNISHES.

The Murphy Varnishes, with which the *Railway Age Car* is finished, have long been used by the Pullman Company at their various shops. They are from the factories of Murphy & Co., an incorporated company, of which Franklin Murphy is president, James G. Barnet and H. A. Sherwin, vice-presidents, W. H. Murphy, treasurer, and C. D. Ettinger, secretary.

This concern is undoubtedly, whether considered by the quality of its products or the extent of its operations, the first house in its line in this country, and has a history which is full of sympathy with the spirit of the present age, in which the rapid development of great enterprises is made possible.

The business was started less than twenty years ago, in a very modest way, at Newark, N. J., which place is still the general headquarters, and where their plant, in its completeness and capacity for the production of fine goods, is probably without an equal. The works comprise nine semi-detached buildings, each devoted to a special department of the business, and they are supplied with every appliance which can aid in the more certain production of uniform goods. In addition to the work at Newark, the company have also an extensive plant at Cleveland, an office at 231 Broadway, New York, for the convenience of their customers, and a store at 202 South Fourth street, St. Louis.

In these days more than in any other "knowledge is power," power to grasp, power to utilize, power to accomplish, and now, when the friction of competition rubs more closely than ever, it is only those who have full knowledge of their resources who can hope to come to the front. Undoubtedly the foundation of the success of this company lies in the complete knowledge of its details, possessed by its managers. They are practical varnish makers as well as practical business men, and as close a supervision is kept by them over the smallest detail of factory work as over business transactions of the largest importance. Another reason

doubtless for their success lies in their faith that "the best will win." When they began twenty years ago anything and everything was sold as varnish. The quality was always uncertain, but usually poor. They undertook to make goods of a standard high quality, and to make the name of each one of their different grades mean something as representing quality. The best only was what they strove for, and the policy then adopted has never wavered, until they have seen what was then perhaps but a feeble hope realized in the fruition of a large and prosperous business.

Three ingredients go to the making of varnish. Of these copal gum is the chief, and its handmaidens are linseed oil and turpentine. It is in the proper mingling of these three ingredients that lies the magic of varnish making. Anybody can make varnish somehow, as anybody can make a vehicle of some sort; but the child's rough cart is not more unlike the finely finished and beautifully designed phaeton than the varnish which used to be made in some helter-skelter fashion differs from the lustrous results of modern skill and science.

It requires large capital to select and store vast quantities of each of the ingredients. It requires elaborate apparatus to melt the gum with the utmost care and to mingle with it at exactly the right moment exactly the right proportions of oil and spirits, and it requires a special expert, a trained and experienced painter, to test the ripening and the settling of the commingled fluids, and to decide as to the fineness and purity of the resulting varnish.

GLASS AND MIRRORS.

One of the most important elements in the construction of a first-class passenger car, is the glass through which light is admitted, and, in connection with it — in the case of private, sleeping and dining cars — the mirrors, which contribute so largely to the general effect.

The earlier cars had comparatively few windows, and what they did have were both short and narrow, our fathers and mothers being obliged to assume most awkward and uncomfortable positions in order to obtain even an unsatisfactory view of the country through which they passed. The glass used was of a most inferior quality, thin, far from being clear, and cut into contracted little panes, like those used in the earlier residences. It is not long since some prominent railways added to the other discomforts and annoying defects of these unsightly little windows, by inserting in their center a still smaller window, presumably for the admission of air, the benefits of which, if there ever were any, were much

more than offset by their unsightliness, the dust which they admitted and the colds directly chargeable to their unwise use.

For the wonderful transformation which has been wrought in this feature of car building, the traveling public are very largely indebted to the old New York glass importing house of Theodore W. Morris & Co., which has, throughout its existence of forty-five years, made the wants and requirements of the railways in this matter a careful study, co-operating with car builders in every advance step, and itself suggesting, from time to time, important improvements which are now enjoyed by all who travel.

This house is composed of Theodore W. Morris and Augustus C. Downing, Jr., and has had a continuous and honored existence since 1837, when the firm of Schanck & Downing was founded by Daniel S. Schanck (father-in-law of Mr. Morris) and Augustus C. Downing (father of Augustus C. Downing, Jr.). With an experience so wide and extending over so long a period, it is not surprising that it has acquired the envied position at the head of the list of importers of fine glass, in this country.

The entire complement of glass entering into the construction and furnishing of the *Railway Age Car*, including windows, doors, decks and mirrors, was furnished by this house, and is a more forcible evidence of its good taste and incomparable facilities, than would be any praise possible to print in these pages. It is of the finest and most expensive character, costing not less than one thousand dollars to import. It is the first quality of polished plate, reduced to a special thickness of three-sixteenths of an inch, and was imported for this car from the works of Pilkington Brothers, St. Helens, Lancashire, England. The delicate and expensive etching was done by Theodore W. Morris & Co., from designs furnished by Pullman's Palace Car Company, and the silvering of the mirrors, which are the finest ever placed in any car, was also done by the first named company, whose railway patrons include such corporations as the Pennsylvania R. R. Co. and the Pennsylvania Company, Pullman's Palace Car Company, the New York Central & Hudson River, Delaware, Lackawanna & Western, Central of New Jersey, Boston & Albany, Manhattan Elevated, and New York, New Haven & Hartford railways.

Taking the car window of thirty or forty years ago, and comparing it with those of the *Railway Age Car* or with the very large pattern recently designed by the Pullman Company, and adopted for the day coaches of the New York, Chicago & St. Louis road, we have a contrast at once most striking and gratifying.

THE DRAPERY, CARPETS AND UPHOLSTERING.

After the carpenters and painters and paper hangers have finished a house, it is still bare and cheerless until the carpets and upholstering are added. Even then cheap or unsuitable carpets and other textiles mar the whole effect. The selection of appropriate colors and qualities is one of the most difficult tasks connected with the furnishing of a house or car, and it is a vast relief to the purchaser to be able to command the experience and taste of an establishment which makes a business of constantly deciding these questions. The extensive house of Judson & Co., corner of State and Washington streets, Chicago, now stands in the front rank in this line. Mr. Judson is himself the possessor of exquisite taste and judgment in the selection of goods, and in so arranging and applying them as to produce the most pleasing effect, and his assistants are scarcely less thorough than himself. It is well understood by people of culture and means that in purchasing carpets, curtains and upholstery goods, it is all important to deal with those who possess these accomplishments. That the Messrs. Judson & Co. do possess them is evidenced in a most striking manner by the rich Axminster carpets, the heavy tapestry window curtains, drapery and embroidered velure upholstering which contribute so largely to the attractiveness of the Parlor, Private Room and Sections of the *Railway Age Car*.

In few other respects has there been such marked improvement in taste, in combining colors, varieties of material, trimmings, and in treating them all so as to produce the most pleasing effect, as in the draping of homes, whether on stone foundations or on wheels. So many considerations are necessary to be kept in view, that only those who make the art—for it is an art, indeed—a constant study are able to keep abreast of the progress being made in this most interesting branch in household decoration.

Some idea of the important part in the general effect which the drapery of this car performs, may be obtained from a critical examination of the Parlor and the approaches to it, where the force of this assertion is most strikingly illustrated. It is something in which Mr. Judson has good cause for pride.

Among the changes which time works in matters pertaining to the furnishing and ornamenting of homes, and which are generally the result of a constantly advancing taste, probably none have been more marked during the past five years than that which has discarded the cumbersome, creaking, generally out of order doors which heretofore connected principal apartments with each other, and all of them with halls and passage-

ways, and substituted graceful drapery in their stead. It may be termed a revelation. Certainly it has opened a new field for the exercise of taste, and it is fortunate that there are Judsons with the ability to creditably supply the demand thus created.

THE HEATER.

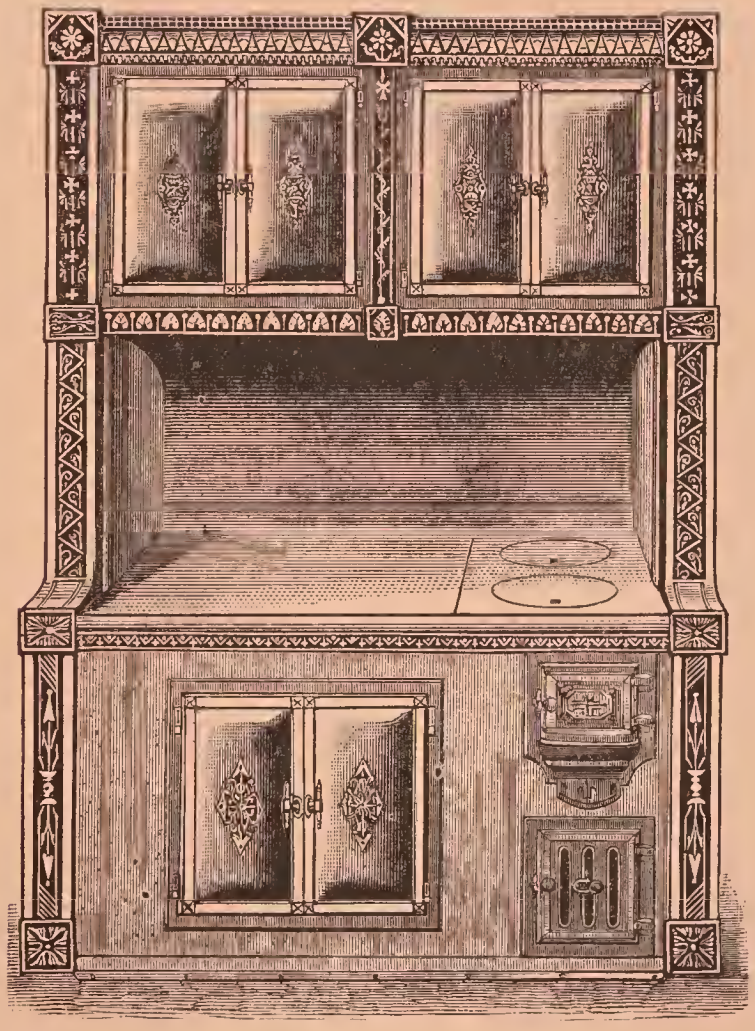
To heat a railway car in motion thoroughly, evenly and constantly, and yet not excessively, is a difficult thing. The common stove can easily be made, as passengers in the ordinary day coach will painfully testify, a medium of extreme discomfort and serious danger to health. The brakeman can easily crowd it full of wood or coal and increase the temperature of the car to a fearful extreme, and with still greater ease may neglect the stove altogether until the other extreme of cold has been reached. The common stove, which needs constant attention and then will only heat one corner of the car, will not answer now for railway use.

The heater invented by Mr. J. Q. C. Searle, of Cincinnati, and manufactured by the Union Brass Company, of Chicago, is a new invention as compared with the Baker & Smith heater, which so long and so sternly held the position of a monopoly, and is in every respect equal to it, while in many respects its superior. That we are not claiming too much, we feel sure an examination of the heater furnished this car by the Union Brass Company will abundantly prove. It is certainly the most complete, as well as most beautifully finished car heater thus far produced in this country.

THE KITCHEN RANGE.

The idea of cooking upon a railway train, at first glance seems absurd, and its practical application is of very modern origin. Possibly the suggestion was obtained from observing some old lady warming her cup of tea over a spirit lamp, or some anxious mother preparing pabulum for her infant by means of a portable fire; but that a regular hotel meal could be cooked in the small space of a little corner of a railway car, traveling at full speed, to say nothing of obtaining the necessary room for storing the fuel and food and allowing the movements of attendants, was probably not even dreamed of for more than a generation after the railway was inaugurated. So travelers carried their cold lunches with them, or took their chances of dyspepsia by hurriedly swallowing what was set before them at dining-rooms and lunch counters, and not even the wealthy, who would have been glad to pay for it, thought it possible to obtain a warm meal in their car as they pursued long journeys through western

wilds, poorly supplied with table accomodations even of the most primitive sort. But a few years ago the happy inspiration occured to some one in Pullman's Palace Car Company that a dining car might be constructed in which all the requirements of a first-class hotel table might be provided. Evidently if the road-bed were smooth, as it now is on every well regulated modern railway, it would be easy enough to arrange tables in a car, from which passengers could eat. The great trouble was



THE RANGE.

to obtain means of cooking satisfactorily in so small a compass. Meantime great progress had been made in the construction of stoves. The little old fashioned cooking stove upon which meals were formerly prepared with much inconvenience had given place to the range,—a large iron box with abundance of heating surface and conveniences for holding and warming dishes,—and a range made expressly for this purpose was

tried in the first dining car ever built, which was placed on the Chicago & Alton road between Chicago and St. Louis. The idea took immensely with the traveling public, but practical difficulties developed, and the Pullman company became almost discouraged over the attempt to have cooking carried on properly in so contracted a space as was necessary. Mr. N. M. Simonds, of Chicago, an old manufacturer of stoves, believed that these difficulties could be surmounted, and he kept steadily at work making one improvement after another, until now the "Simonds' Patent Wrought Iron Portable Range" is in use in a great number of railway dining and hotel cars and private coaches, and is giving most satisfactory results; indeed, it is almost impossible to conceive of any farther improvement, so quickly and perfectly does this range cook, while occupying small space and requiring a very moderate amount of fuel. The entire feasibility of cooking in cars having now been demonstrated, the use of dining cars has become almost a necessity to every great line of railway, and it is not unlikely that the dining car will, ere long, practically supersede the eating house on all roads of any considerable length, so far, at least, as first-class travel is concerned. Besides this, the successful application of the range has made possible the construction of private cars in which railway officers and travelers of means can eat as well as sleep, carrying their hotel with them and being entirely independent of localities, or connections, or times of journeying, so far as their table is concerned.

The range which Mr. Simonds has with great enterprise and liberal expenditure constructed for the *Railway Age Car*, is made from entirely new plans, and we believe it to be superior, both in beauty and in serviceableness to anything of the kind ever before manufactured. It is finished entirely in heavy nickel-plate and solid black. The beautiful ornamentation of the exterior was made at considerable expense, expressly for this range, and no person who examines it can fail to be delighted, both with the attractiveness of its appearance and the remarkable economy of space with which it does its perfect work. Those who may journey in this car will be more than satisfied that with a Simonds range, meals can be served quickly, satisfactorily, and with a sufficient variety of dishes. If it is a complete success with the difficult surroundings of a railway car, it is needless to say that for hotels, restaurants and residences, it is all that could be desired. Various sizes are made, some containing as many as sixteen holes, two baking ovens and two fires, an adjustable grate for coal or wood, and other conveniences, such as attachments for heating water, and steam table for cooking by steam when desired, etc. The illustration here given is a faithful representation of the front view of the range in this car.

THE KITCHEN UTENSILS.

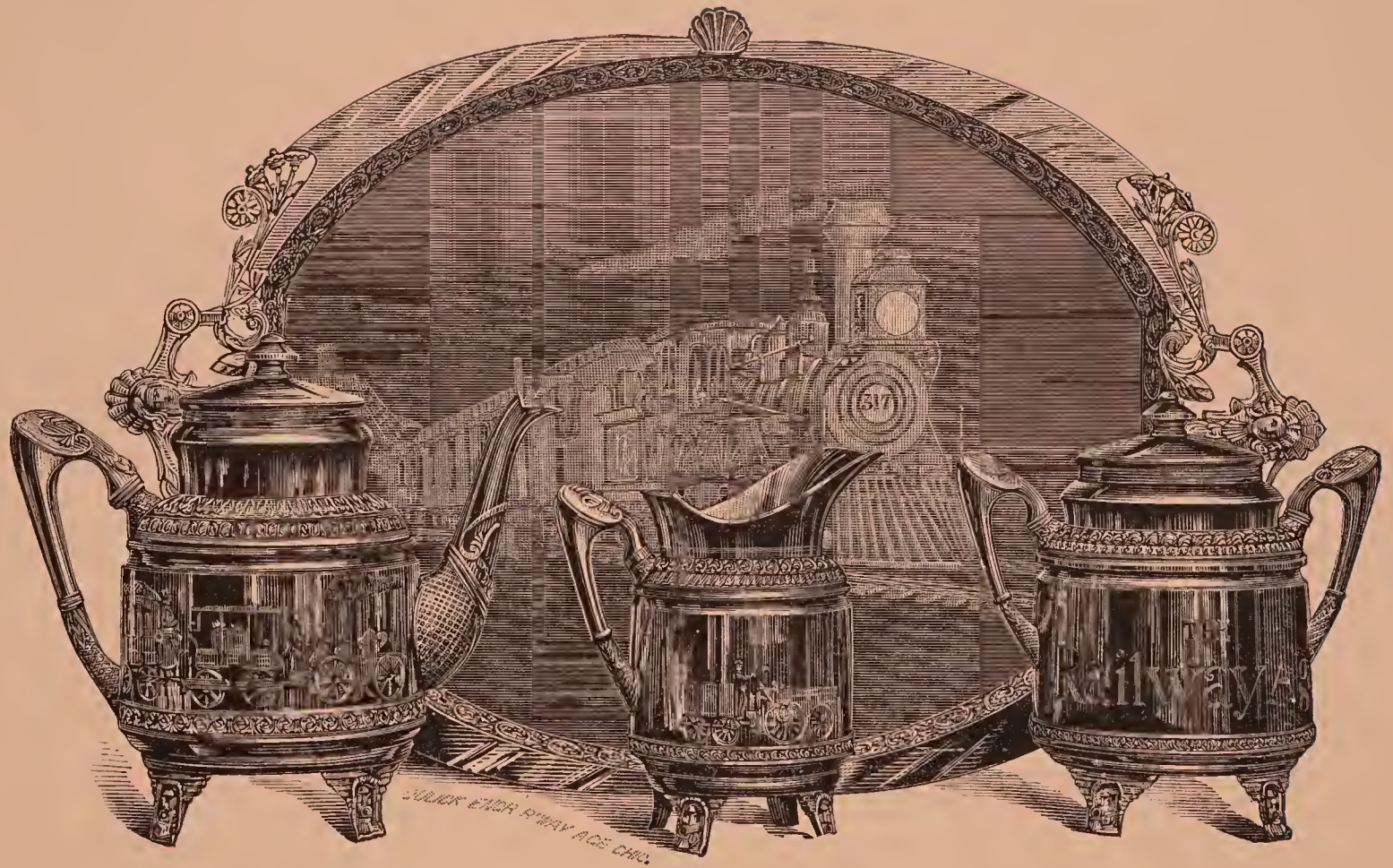
Every good housekeeper will appreciate the various utensils to be found in the kitchen and in the butler's pantry of this car, because of their completeness both in design and finish, and especially will the copper articles be admired. These are from the great works of The Adams & Westlake Manufacturing Company, of Chicago, and constitute a display which is most creditable to the good taste and superior workmanship of this well known establishment.

THE SILVER SERVICE.

One of the most attractive features of the dining table of a private residence should be the silver service. Here is opportunity for the exercise of taste which will be observed and appreciated by every guest before whom it is placed. This is equally true of the table of a dining or private car. In fact there is, if possible, greater need here, because of the unusual surroundings, in themselves not without elements of romance, and possessing strong incentives to the exercise of refined taste and the indulgence of one's desire for the comforts and conveniences of modern refinement. A peep into the butler's pantry or the dining room of a modern private or dining car which has been provided with an elegant service of silver along with its other interior equipment, is a revelation. It instantly sets one to comparing mentally the comforts of travel now with the discomforts of the early years of our railway history, when our elder brothers and sisters thought it a glorious privilege to be given "twenty minutes for dinner," a worse than indifferent "eating house," and complained not at being obliged to trudge a hundred yards or more through mud and rain to secure a poorly cooked and worse served meal. Now-a-days the traveler may sleep comfortably, dine luxuriously and at his pleasure, using all the time he would use at his home, smoke his cigar, give his muscles needed relaxation, and otherwise enjoy a journey of a thousand miles or more by rail without leaving the train for a moment or being subjected to a single inconvenience.

The elegant silver service of which we started out to speak, was made for this car by the Rockford Silver Plate Company of Rockford, Illinois, from original designs prepared by its own artists, and is one of the most complete and appropriate ever gotten up. It consists of 151 pieces as follows:

One ice pitcher, two tea pots, six casters, one salver, eight creamers, five butter dishes, eighteen dinner knives, eighteen forks, six butter



THE SILVER SERVICE.

knives, one sugar sifter, six sugar spoons, four mustard spoons, two olive spoons, twenty-four dessert spoons, eighteen tablespoons, thirty teaspoons.

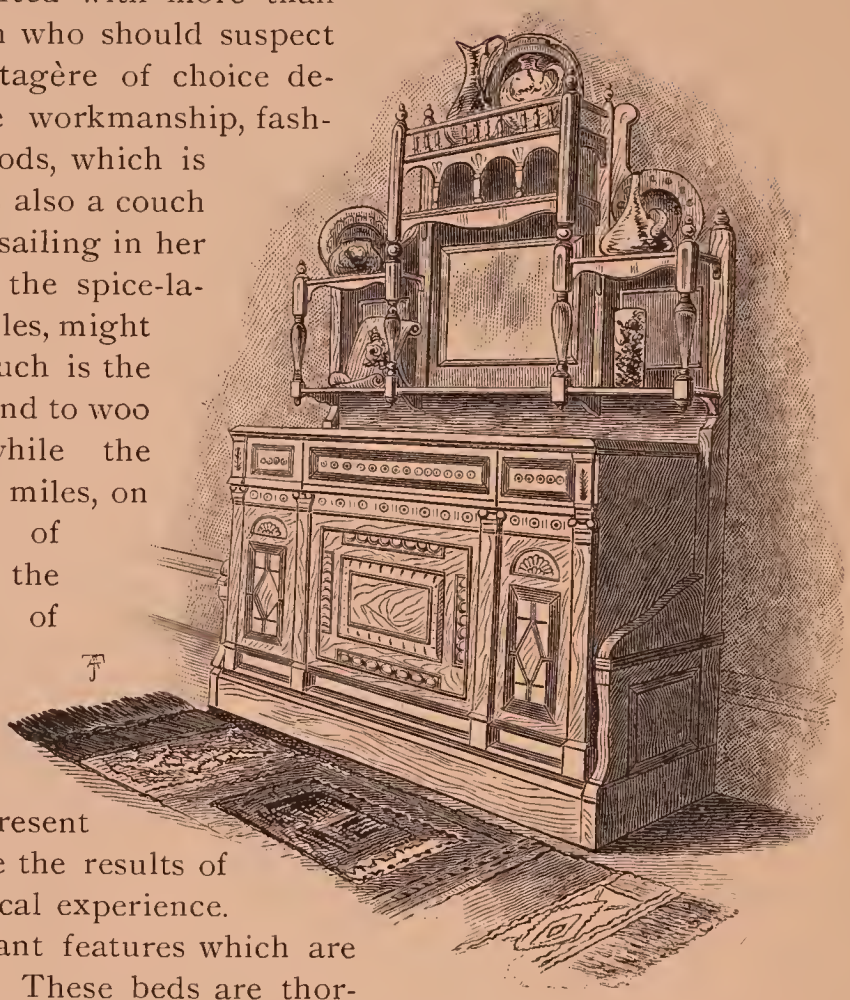
On one side of the larger articles are engraved illustrations of old locomotives and cars, representing the early days of railroading, with the exception of the salver, which presents a striking engraving of a modern train just departing from a beautiful station, and one of the tea pots, on which is shown a modern locomotive. On the reverse side of all these articles is engraved "*The Railway Age*," and on the smaller articles the monogram of the *Railway Age* is given, while on the feet of each article is engraved a locomotive emerging from a tunnel. The designing of this service, as will be seen by a glance at the full-page illustration of a group of a few of the more prominent articles given in this volume, reflects great credit upon the manufacturers.

The Rockford Silver Plate Company is a Western institution, full to the brim of enterprise and push, conscientious and strictly honorable in its methods, progressive, public spirited, and as a natural and proper result, eminently prosperous. Its works at Rockford (the queen of western towns) are very extensive and are equipped with the most approved machinery, its employes are thoroughly trained in their work, and its product stands by the side of the highest in the trade. The officers of the company are H. W. Price, president, Irvin French, vice-president, Geo. B. Kelley, secretary and treasurer. Mr. Kelley is, in fact, the manager and is largely entitled to the credit of bringing the establishment to its present prosperous condition.

THE FOLDING BED.

Among the many comfortable inventions of the present day none rank higher than the modern folding bed. We say "modern," because when the century was young our grandparents used the "bureau bedstead," an apparatus the chief merit of which was its sterling honesty, for, though when done up for the day, and its real purpose was supposed to be hidden under the guise of a "chest of drawers," the attempted deceit was so palpable and easily discovered as to rob it of all guile.

It never came into very general use for manifest good and substantial reasons, which it is unnecessary to emphasize with particularity here, still here was the germ which was destined to fructify and bear fruit in our day. All the old objections have been met and overcome, one by one, and as the perfect realization of the union of luxury, elegance and utility, we can point to the folding bed of the *Railway Age Car*.



He must be gifted with more than natural penetration who should suspect that the elegant étagère of choice design and exquisite workmanship, fashioned of rarest woods, which is shown in the cut, is also a couch such as Cleopatra, sailing in her gilded barge amid the spice-laden airs of orient isles, might have envied; but such is the solid prosaic fact, and to woo sweet slumber, while the minutes count the miles, on the downy pillows of such a bed is truly the crowning triumph of travel.

A. H. Andrews & Co. are the manufacturers, and its perfection and present great popularity are the results of fifteen years' practical experience. It has many important features which are found in no other. These beds are thoroughly comfortable, of superior construction and finish, and present a most pleasing appearance when closed. They occupy very small space, being in depth only twenty-two inches, and yet holding mattress, pillows and bedding. They are not disarranged in folding, after being made up; nor is the mattress divided into sections, since the woven wire springs when folded are off tension, taking no more room than the thickness of the wire, viz., one-half inch. They do not require heavy weights for balancing, but are light and portable, placed on large casters, and weigh only 100 to 200 pounds, and are very easily moved from one room to another. They are fitted with woven wire mattresses of finest quality; do not require moving out into the room before opening, and the ventilation, even when closed, is perfect, the back being open when the front is closed, a most important advantage.

THE DOOR AND WINDOW FIXTURES.

The locks, catches and other fixtures with which the doors of this car are equipped, and which combine every element of strength, security and beauty that inventive genius and mechanical skill have been able thus far to produce, are from the well known manufactories of the Union Brass Company, of Chicago, and Post & Co., of Cincinnati. The window fixtures are from the first named firm and the Phosphor Bronze Smelting Company, of Philadelphia.

THE ELECTRIC CALL BELLS.

It is a very great convenience in a railway car, especially at night, to be able to summon an attendant instantly to one's compartment or berth. It would hardly be feasible to do this by means of the old fashioned bells and cords, and hence electricity has been ingeniously applied to this humble but useful service. The Western Electric Company of Chicago have furnished the electric call bells, which, by the slightest touch upon either of the half dozen buttons that have been placed at convenient points, will summon attendants to any part of the car, and without disturbing the other occupants. This adaptation of electricity to the instantaneous ringing of bells in cars, hotels, private houses, business offices, etc., has assumed extensive proportions within a very short time, and improvements have been made by the Western Electric Company which render the plan not only inexpensive, but reliable and in every way satisfactory.

The "register" in the butler's pantry, on the face of which the exact location of all "calls" is indicated, is in itself an exquisite bit of workmanship, and will not fail to attract the visitor's attention. The president of the Western Electric Company is Gen. Anson Stager, so well known through his long and prominent connection with the Western Union Telegraph Company.

THE FAITHFUL TIME KEEPER.

The beautiful clock, which overlooks the parlor of this car from its elevated position above the large mirror, is from the extensive works of the Ansonia Clock Company, of Ansonia, Connecticut. Its machinery is so finely and carefully made that it ticks out the exact time with unerring fidelity, night and day, notwithstanding the jars and shocks to which a car is necessarily subjected. No time-keeper, occupying a favored place on the most elegant mantel in the land renders more faithful or

more appreciable service. Two of the specialties produced by this company are depot and locomotive clocks, of which railway companies are large purchasers.

THE WATER COOLER.

The very handsome piece of furniture which occupies a niche in the passage-way between the sections and the butler's pantry, from which a glass of cold water can always be obtained, is from the great establishment of the Adams & Westlake Company. It was especially designed to fit this niche, and will, as it deserves, receive its full meed of admiration. The silver-plating is especially noticeable, being of the heaviest character and finest polish, intended to last as long as the car shall last. The base on which the cooler stands consists of a finely cut piece of the most beautiful Tennessee variegated marble, from the quarries of Beach & Co., of Knoxville, that state. A wide silver plated band, passing around the cooler and fastened to the partition against which it stands, keeps it securely in position. It is not many years since passengers in day cars were served water much as if they had been animals, the "train boy" coming around at long intervals and doling it out to them in a tin cup from a vessel of like material, the operation generally being attended by marked disregard either for civility or cleanliness. From this to the cooler which now has its place in every car, the transformation has been a most creditable one.

WINDOW SHADES, ROLLERS, ETC.

The window shades, hung upon the celebrated Hartshorn self-acting roller, are furnished by Messrs. E. Jennings & Co., Chicago. This roller, with its self-acting spring and easy and quick movement, is a wonderful improvement upon the troublesome old-fashioned cords and pulleys, which were always getting out of order and letting the curtain drop down without warning. Messrs. Jennings & Co. furnish window curtains and fixtures of every desirable kind for use in cars and residences, and make careful study of the best means of doing so in the most satisfactory manner possible. Their taste and skill are visible in almost every Pullman car that has been built in the last five years, as well as in a very large number of fine cars built by and for other corporations. The shades used in this car are similar in material and design to those ordinarily used in the later Pullman sleeping cars, and are believed to come as near to the peculiar requirements of this particular use as any that it is possible at present to provide.

VENTILATORS AND DUST-GUARDS.

The problem of ventilating railway cars and at the same time preventing the entrance of dust and cinders, has taxed the ingenuity of numberless inventors, and the list of devices that have been tried and finally abandoned is long and discouraging. Pure air is an absolute necessity, and yet its mixture with dust and cinders is a source of vast discomfort to railway travelers. The Globe Ventilator Company, of Troy, N. Y., whose devices are applied to this car, seem to have come as near as is now possible to solving the important problem of letting in the air at proper times and in proper quantities, and excluding its objectionable accompaniments. In few directions has the progress of the last few years in car building and equipping been as great as in this very important matter of ventilation.

BELL CORD AND FIXTURES.

The bell cord used in this car is made of the finest silk, by the Silver Lake Company of Boston, a corporation established in 1869, and at the present time employing in the manufacture of its varied products almost three hundred thousand dollars. Its solid braided cords are probably without an equal, and these and its signal lines, bell cord couplings, packing and other specialties, are used by very nearly all the railways in this country. The packing is made from pure cotton and the finest talc and has acquired a most enviable reputation. The company's braiding machines are claimed to be the only ones in existence that will produce a perfectly hard and smooth cord, and are very ingenious in their construction. The readiness of the company to consider and adopt suggestions looking to the improvement of its product, has contributed largely to its success.

RECLINING CHAIRS.

Next to a bed no article of furniture can afford more comfort than a chair capable of being adjusted to various positions to suit the different conditions of body and mind. Three very ingenious and comfortable kinds of reclining chairs are shown in this car, manufactured respectively by the Union Brass Company of Chicago, Dr. N. N. Horton, of Kansas City, Mo., and Marks & Co., of New York. Large numbers of reclining chairs are now used in railway cars, and they form a happy medium between the ordinary seat in the day car and the very comfortable berth in the sleeping car. They are especially adapted to short night

journeys, and, indeed, to a long night journey in case the traveler cannot afford the luxury of the Pullman sleeper. Each of these chairs has its peculiar advantages, and each will be found very comfortable and luxurious. They are a modern invention, Dr. Horton being their pioneer, and the Chicago & Alton railway the first, we believe, to systematically use them. In a very few years the reclining chair has sprung into popularity with the traveling public, as have few other inventions intended for railway use.

THE SPEED RECORDER.

Every traveler on a railway train is naturally curious to know how fast he is traveling; but this information is much more than a matter of mere curiosity to the train men and their officers. The speed of passenger trains can be very easily regulated by reason of the fact that they run upon a regular schedule, have their appointed stops of limited duration, and are kept closely in hand, in order to make the time required by the card; but with freight trains this is quite different. They are necessarily obliged often to stop longer at stations in order to do switching, or to wait for other trains. They vary greatly in weight on different days and at different parts of their route, and many other circumstances tend to make it impossible to run upon an exact schedule for arriving at and leaving stations, as passenger trains do. Most roads have rules limiting the time of freight trains, some to twelve and others to fifteen miles per hour, a few allowing even faster time; but the great difficulty has been to compel engineers and conductors to obey the rules, and not indulge in fast running. The temptation to excessive speed is often very great. As the freight train is liable to be delayed at stations in switching, the train men are sometimes inclined to "steal time" by stopping longer at agreeable points than is necessary, and then trying to make up this lost time by fast running. To these violations of rules is to be attributed a very large share of the frequent accidents to freight trains. After loafing at the station or crawling slowly up a heavy grade, the trains have been sent thundering down a steep incline at a terrific rate of speed, resulting often in wreck, and always in great damage to roadway and rolling stock.

How to detect and stop this abuse, was, until within a few years, an unsolved problem. Trainmen naturally dislike to report each other, and the "old man" could not always be hiding under bridges waiting for trains to come along so that he might catch the "boys" in the act of fast running. Inventive genius, however, was at work endeavoring to

produce a device whereby the speed made by the axle could be communicated to an appliance which would accurately and permanently record it for investigation, and we now have two or three successful speed recorders which are in use on the freight trains of many of our leading roads, giving a history of each trip with unfailing accuracy.

The oldest and best known of these admirable appliances, is the Wythe "Self-Registering Speed Recorder," which is the invention of a Methodist minister, Rev. W. W. Wythe, D.D., now of Ocean Grove, N. J. One of these wonderful instruments occupies a place in the observation room of the *Railway Age Car*, and will prove to be a most instructive and interesting appliance.

THE SEAT AND BERTH SPRINGS.

A journey in this car, which shall occupy a day and a night or more, will not fail to elicit praise of the springs which render the seats, sofas and berths so truly luxurious as they will be found to be. These were made by Cobb & Son, of Chicago, and E. L. Bushnell, of Poughkeepsie, N. Y. The material used is the very best steel, and the workmanship which produced them does not fall behind the material in merit. The Cobb spring is spiral in form, while the Bushnell is elliptic, both styles, however, possessing advantages that have given both a most enviable reputation.

BRASS AND SILVER PLATED TRIMMINGS.

Of the great establishment whose familiar stamp appears on very nearly all the smaller fittings which are to be seen in every nook and corner of this car—The Union Brass Manufacturing Company, of Chicago—little can be written which can possibly add a feather's weight to a proud reputation already as wide as the country itself. In fact, the fame of its product is not confined to our own shores, but has gone abroad and is familiar to railway circles in many countries where our language is little known, and where the prejudice against American competition is only overcome by extraordinary merit.

These articles, which include door locks, knobs, sash lifts and springs, cupboard catches, night latches, bolts, hinges, butts, berth trimmings, tumbler holders, window fastenings, bell cord fixtures, screws, coat and hat hooks, arm-rest brackets, and scores of other fittings, each of which may seem to possess little importance, yet all of which are absolutely necessary to the comfortable and complete equipment of a first-class car, involve in their designing, the highest talent, and in their manufacture, skilled labor and a very large amount of capital.

Could the reader examine specimens of these articles as made and used at different periods through the past thirty years of our railway history, tracing the progress through these years as he would study the advance of a conquering army or the growth of a cherished tree that is to afford him shade in his declining years, and compare the old, as represented at the outset of his examination, with the new, as seen in the Union Brass Company's store-rooms of to-day, he would marvel that such wonderful improvement could have been accomplished. To this company belongs very great credit for the progress and improvement in perfecting interior car trimmings which are mentioned above, and its contribution to the *Railway Age Car* is pointed to with unfeigned pride and satisfaction.

THE MARBLE.

The beautiful marble to be seen in the toilet rooms and under the water cooler, is from the extensive quarries of Beach & Company, of Knoxville, Tenn., and was shaped to its present forms by Sherman & Flavin, of Chicago, who have long done much of this kind of work for railway cars. It is a very superior specimen of this world-famous marble, is handsomely variegated and takes a polish seldom equaled. Then, too, no ordinary substance will stain its surface, a quality which especially commends it for purposes of this nature.

Why people persist in the use of white marble for anything but tombstones, when there is in the mountains and hills of Tennessee, an exhaustless quantity of the variegated article of which we have spoken, is matter of surprise. Certainly they cannot have seen such beautiful specimens of this marble as those by which it is represented in the *Railway Age Car*.

THE REFRIGERATOR.

In the butler's pantry will be found the refrigerator, in which are kept such articles as are naturally required to be kept cool. It is built to occupy a space which, although not intended for it, could not be utilized to so great advantage for any other purpose. It is a Lorillard patent and manufacture, and is made of solid mahogany, with double French plate glass doors, and is divided into three separate compartments, the upper of which receives the ice, the others being sub-divided, for convenience, by several movable slats. On either side are air chambers through which the cool air passes around the entire refrigerator, keeping the temperature in perfect condition so long as there is ice above. It is not only a beautiful piece of workmanship, but its remarkably efficient service

proves the principles upon which it is constructed to be in every way deserving of approval.

The Lorillard Refrigerator Company is a New York establishment, and is composed of gentlemen of unquestionable business integrity,whose every promise may be relied upon with implicit faith. The refrigerators made by them are equally as valuable for residences as for cars.

THE BUILDERS OF THE RAILWAY AGE CAR.

It would be an inexcusable omission to close this little volume without making some special and extended reference to the great car works of the Pullman Company, by which this beautiful car was designed and built. No other institution in America is so closely identified with the progress of the railway interests of the country, in the important matter of rendering traveling not only comfortable but luxurious, as is this company.

Its President and governing spirit, Mr. George M. Pullman, having commenced his career with a single car, transformed from a day car into a sleeper, less than thirty years ago, and having experimented constantly ever since, studying closely the needs of the traveling public in the direction in which his efforts have been employed, is better able than any other man to determine what is needed, and to provide for the public demands. This he has done in a remarkable degree, always leading instead of following, anticipating these needs instead of waiting to comply with imperative demands (as is too often the case) notwithstanding the largely increased expenditure required of him because of this liberal policy. It would be exceedingly interesting to follow from the humble beginning referred to, the wonderful progress that has been made by Mr. Pullman in the construction and equipment of sleeping cars up to the present time. All over the land, and even in Europe, the name of Pullman, when connected with travel, is an indication that the very best accommodations may be expected. So universal is this that for many years past the railway companies which use his cars have advertised the fact in all their printed matter as a special inducement to the traveling public to patronize their trains. Very few railway appliances indeed have ever acquired this independent position; the only others which we can at present call to mind being the "Miller coupler and platform" and the "Westinghouse brake." It is a distinction which is very seldom reached, and when reached means greatly more than is at first manifest.

For many years the product of the Pullman Car Works has deservedly occupied the head rank, not alone as regards sleeping cars, but day cars as well. The extensive works at Detroit, although among the greatest in

the country, have been more than doubled by the erection of those at Pullman, ten miles south of Chicago. Considered together, these constitute unquestionably the most extensive establishment of the kind in the world.

The works at Pullman are particularly complete, and may be considered a greater monument to their projector than would be any marble shaft possible to be erected. Not only are these works the most extensive and complete in every respect, in the land, but they are surrounded by those elements which go to make up the comforts, conveniences and refining influences that ought to be considered by all who employ large numbers of artisans. In this respect, an example has been set by Mr. Pullman which is eminently worthy of imitation.

With such surroundings the average mechanic becomes a superior workman because of the enlarged views and new ambitions which they instill, and just in proportion to the other beneficial results that are experienced are his services more valuable to his employer.

In the important matter of designing the interior arrangement and ornamentation of the finer class of cars, the Pullman Company has been the recognized leader for years, as well as in the more practical matter of the comforts heretofore referred to. In all these the *Railway Age Car* illustrates more forcibly than could words, the high standard which this company has reached in the advancement of car building. We feel sure that an examination of the various departments of this car, and above all a journey in it, would prove the correctness of this statement beyond doubt or question. That it reflects as great credit upon the Pullman Company, by whom it was built, as it does upon the various manufacturers of appliances entering into its construction and furnishing, or upon the paper for which it was built, we feel sure no one will question.

The Railway Age,

A Weekly Journal of Transportation,

PUBLISHED BY

The Railway Age Publishing Company,

AT CHICAGO, U. S. A.

E. H. TALBOTT, President and Manager.

H. R. HOBART, Vice-President.

JOHN MORRIS, Secretary.

Editors:

E. H. TALBOTT. H. R. HOBART.